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FROM THE

UNITED STATES GOVERNMENT

ANNUAL REPORTS, WAR DEPARTMENT
FISCAL YEAR ENDED JUNE 30, 1911

REPORT OF THE
CHIEF OF ENGINEERS
U. S. ARMY

1911

IN THREE PARTS

PART III

WASHINGTON
GOVERNMENT PRINTING OFFICE
1911

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APPENDIXES

TO THE

REPORT OF THE CHIEF OF ENGINEERS,

UNITED STATES ARMY

(CONTINUED).

APPENDIX O O.

IMPROVEMENT OF RIVERS AND HARBORS IN THE BUFFALO, N. Y., DISTRICT.

REPORT OF LIEUT. COL. J. G. WARREN, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Erie Harbor, Pa.
2. Dunkirk Harbor, N. Y
3. Buffalo Harbor, N. Y.
4. Black Rock Harbor and Channel, N. Y.
5. Tonawanda Harbor and Niagara River, N. Y.
6. Niagara River, N. Y.

United States Engineer Office,
Buffalo, N. Y., July 6, 1911.

Sir: I have the honor to forward herewith reports of operations * * * on river and harbor works in this district during the fiscal year ending June 30, 1911.

Very respectfully, your obedient servant,

J. G. Warren,
Lieut. Col., Corps of Engineers.

The Chief of Engineers, United States Army.

O O 1.

IMPROVEMENT OF HARBOR AT ERIE, PA.

REPORT OF OPERATIONS.

At the beginning of the fiscal year the work of dredging harbor basin abreast and west of the public dock to depth of 20 feet at mean lake level under contract with the Central Dredging Co. was suspended. It was resumed July 9, 1910, with one large dredge, and a second dredge began July 16, 1910.

The work was completed July 30, 1910; amount removed 133,067 cubic yards, scow measure, at a total cost of $24,228.56, including engineering and contingencies.

Dredging inner channel and east and west ends of harbor basin to depth of 20 feet at low water (21.7 feet at mean lake level) was begun with one dredge September 6, 1910, under contract with the Great Lakes Dredge & Dock Co., was suspended for the season November 14, 1910, and resumed April 13, 1911. The work was completed

June 6, 1911, at a total cost of $40,554.20, including engineering and office expenses.

Repairs to south breakwater, consisting of resetting dislodged paving stone and filling joints with Portland cement grout on inner 850 feet, were begun October 1 and completed November 22, 1910, at a cost of $607.50 for supplies and labor.

Minor repairs were made to boiler and machinery of launch *Gwendolen* during March, 1911.

The tug *Sheldon Bros.* was sunk in harbor basin and abandoned by owner. The wreck was removed by the United States under contract with The T. A. Gillespie Co., at a cost of $89, the removal being completed June 10, 1911.

The surveillance of Presque Isle Peninsula was continued throughout the fiscal year, a watchman being on duty to see that no depredations were committed, to put out fires which occasionally occur, and to prevent squatters from settling along the harbor shore by hauling house boats thereon and thus establishing a residence.

CONDITION OF THE WORKS.

The south pier and south breakwater are in good condition. The north pier is in good condition, except 755 feet with timber superstructure, which will be replaced with concrete, with funds on hand.

The entrance channel and harbor basin are in good condition, but some dredging will be required in the channel from time to time.

The preservation of the peninsula is of vital importance to Erie Harbor, and it is for the purpose of preserving the harbor that the protection of the weak parts of the peninsula has been deemed necessary. The weakest portion is the long, narrow neck at the western end, and works of protection have been constructed to prevent a breach through this narrow neck. The danger exists during severe storms from the westward.

The protection works for the neck consist of the remains of a shore protection constructed in 1889, which affords little or no protection, and the tree growth propagated and maintained on the neck. During 1896–1898 about 6,600 young locust and willow trees were planted on the neck of the peninsula. Most of these have grown finely, but some of the outer ones have been washed out by heavy seas.

The beach erosion along the body of the peninsula has not been materially corrected by jetties built out from the shore. At the present time there is one dilapidated jetty at the easterly end, no longer of service, and three jetties about the middle of the peninsula shore, one of which belongs to the Lighthouse Service, in fair condition.

Severe storms make some changes in the shore lines of the peninsula, but no serious damage is done.

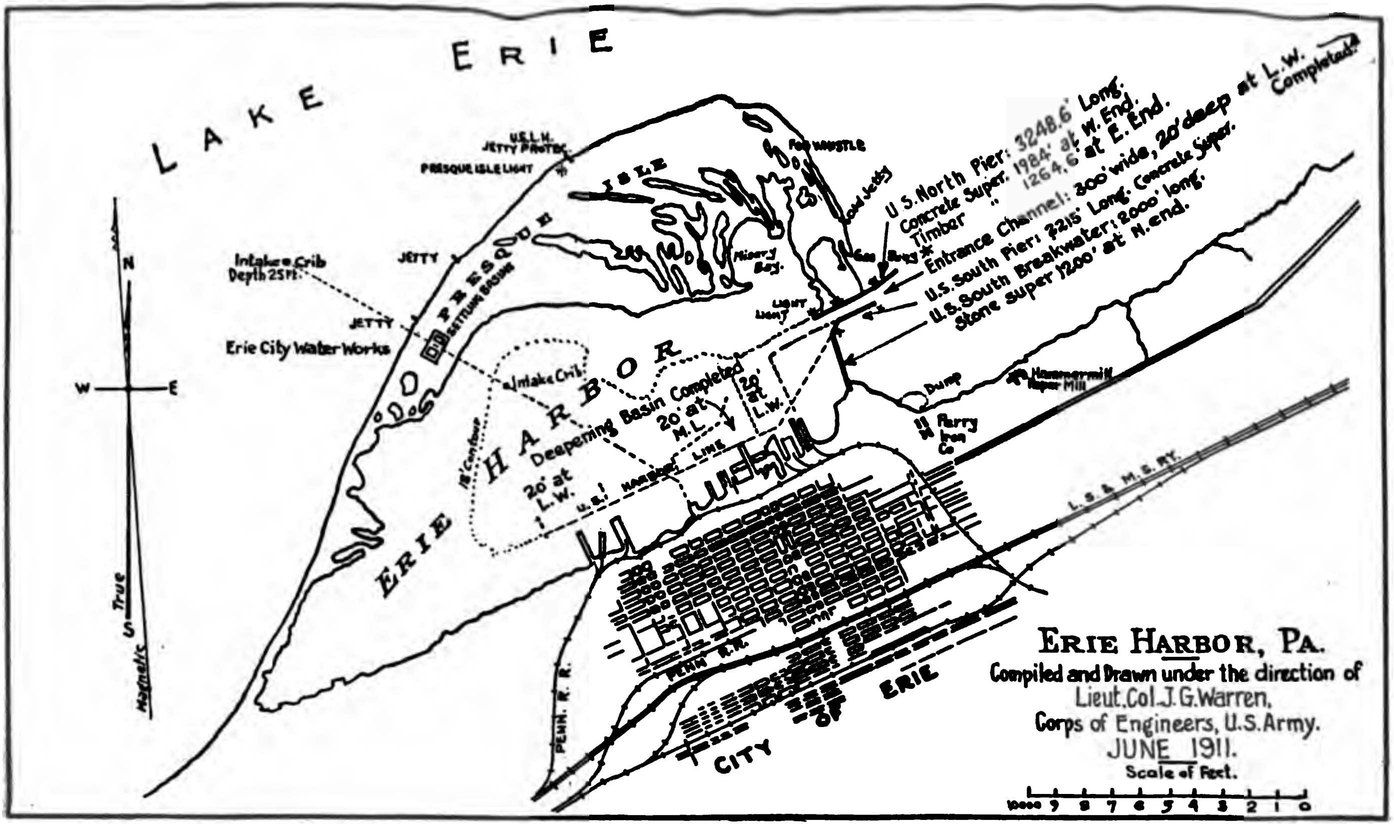
PROPOSED OPERATIONS AND REMARKS.

The project for improvement is completed, except—

(*a*) Extension of the north pier as required from time to time to cover the advance lakeward of the 16-foot contour of depth.

(*b*) The conditional provision for two spurs on the outer shore of Presque Isle.

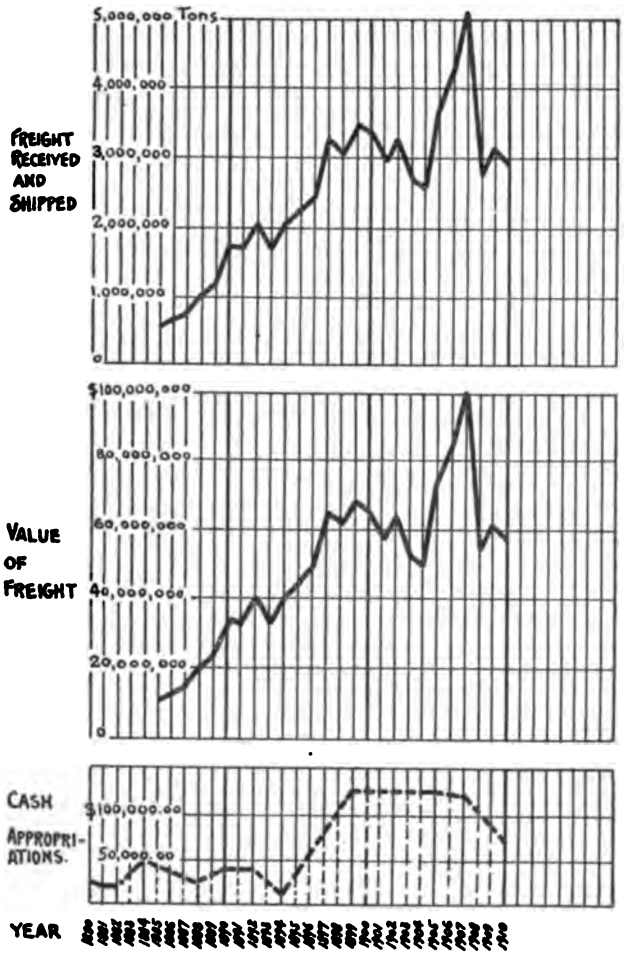
(*c*) Maintenance, which will be required indefinitely.



ERIE HARBOR, PA.

Compiled and Drawn under the direction of
Lieut. Col. J. G. Warren,
Corps of Engineers, U.S. Army.
JUNE 1911.

ERIE HARBOR, PA.



Pier extension is not now required, and the construction of the spurs is not considered advisable. A reserve of $20,000 for the protection of Presque Isle Peninsula is on hand, as required by project. No funds for continuing improvement are, therefore, required for the fiscal year ending June 30, 1913.

Under maintenance, it is proposed with funds on hand to replace 755 linear feet of old decayed timber superstructure on the north pier with concrete and to make minor repairs on the piers and do dredging when necessary in the entrance channel and basin to maintain project depths.

No estimate of funds is therefore made for the fiscal year ending June 30, 1913.

APPROPRIATIONS AND ALLOTMENTS.

For previous projects (as listed in H. Doc. 421, 57th Cong., 2d sess.)	$841,867.23
Sept. 19, 1890	40,000.00
July 13, 1892	40,000.00
Aug. 18, 1894	10,000.00
May 11, 1896	1,289.33
Mar. 3, 1899	125,000.00
June 13, 1902	$125,000.00
Mar. 3, 1905	125,000.00
Mar. 2, 1907	120,000.00
June 25, 1910	70,000.00
Feb. 27, 1911	30,000.00
Received from sales	4,725.72
Total	[1] 1,532,882.28

CONTRACTS IN FORCE.

No contracts in force.

COMMERCIAL STATISTICS, ERIE HARBOR, PA., CALENDAR YEAR 1910.

Season of navigation.—Opened April 12, 1910; closed December 10, 1910.

Vessels entered and cleared.

Vessels.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Registered:					
Steam	1,812	357	2,169	3,709,057	6,252
Sail and barges	102	59	161	201,024	....
Total	1,914	416	2,330	3,910,081	6,252

No record of unregistered vessels.

Decrease of tonnage, 1910 under 1909		59,270
Amount of revenue collected, year 1910:		
Lake commerce		$1,169
Rail commerce		$14,960
Value of imports:		
Lake		$210,946
Rail		$108,023
Value of exports, lake		234,697
Enrolled tonnage, port of Erie	gross tons..	85,266
Greatest draft of vessels	feet..	20

New lines of transportation established: None.

---

[1] In addition to this amount there was allotted, Jan. 11, 1871, from the appropriation made by the act of July 11, 1870, for examinations and surveys for improvements, etc., and for contingencies of rivers and harbors, the sum of $10,000, to be applied to works for the protection of the peninsula at Erie Harbor. The early office records having been destroyed by fire in 1887, it is impracticable to state at this time how much of this allotment was actually expended for the purpose for which it was made.

Receipts and shipments by lake.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
RECEIPTS.				*Miles.*	*Mills.*
Copper	9,638 tons	9,638	$2,409,500	820	2.220
Fish	5,930 tons	5,930	889,500	20	....
Flour	1,218,895 barrels	121,890	6,216,365	819	2.466
Grain:					
Corn	50,000 bushels	1,400	28,000	804	0.447
Wheat	578,730 bushels	19,861	590,305	841	0.440
Iron ore	942,592 long tons	1,055,703	3,676,109	798	0.827
Lath	6,496 bundles	1,624	21,112	820	2.440
Lumber	10,798,020 feet b. m.	18,896	215,960	820	1.573
Mill products	81,925 tons	81,925	4,096,250	821	2.192
Package freight	78,689 tons	78,689	11,803,350	700	4.000
Posts, cedar	1,600	40	800	820	1.573
Pulp wood	40,036 cords	80,072	400,360	800	1.875
Sand and gravel	201,600 cubic yards	302,400	201,600	5	....
		1,778,068	30,549,211	....	....
SHIPMENTS.					
Coal, hard	438,628 long tons	491,263	2,412,454	750	0.400
Coal, soft	421,931 short tons	421,931	886,055	750	0.400
Package freight	176,284 tons	176,284	26,442,600	700	4.000
Pig iron	553 short tons	553	9,678	650	2.308
Railroad iron	386 short tons	386	10,808	917	0.981
		1,090,417	29,761,595	....	....

O O 2.

IMPROVEMENT OF HARBOR AT DUNKIRK, N. Y.

REPORT OF OPERATIONS.

At the beginning of the fiscal year the work of repairing 50 linear feet of the outer end of the west pier under contract with the Great Lakes Construction Co. was in progress, the wrecked cribwork having been removed and the foundation nearly prepared for sinking the new crib in place.

The foundation was completed and the crib sunk in place July 16, 1910; the mass concrete superstructure was placed and all work under the contract completed August 16, 1910, total cost $4,676.98, exclusive of engineering and contingencies. Minor repairs were made to decks of breakwater and pier during July and August, 1910, at a cost of $162.02 for labor and materials. No other work was done during the fiscal year.

Specifications for removal of rocky reef bordering on the inner entrance channel to a depth of 18 feet at mean lake level were prepared and approved, in anticipation of the construction of a suitable concrete dock by the local authorities, or other terminal facilities approved by the Secretary of War, this being the condition under which the funds were appropriated by the river and harbor act of June 25, 1910.

At the close of the fiscal year the conditions had not yet been complied with.

CONDITION OF THE WORKS.

The timber sections of the west pier, one 110 and one 216 feet long, and the old timber part, 1,341 feet long, of the breakwater are in poor condition and need repairs annually, owing to damage by storms.

Examination made June 21–25, 1910, showed:

Outer entrance channel, from deep water in the lake to the elbow in the breakwater, not less than the required depth of 19 feet at mean lake level, for full width, except over a shoal area about 400 feet long on the west channel line, lakeward from Dunkirk Pierhead Light, and extending into the channel from that line about 150 feet. The least depth on the shoal is 15½ feet, and the remainder of the channel along the easterly side of the shoal, 100 feet wide, is 19 feet deep at mean lake level.

Inner entrance channel, from the breakwater elbow to the harbor basin, not less than the required depth of 18 feet at mean lake level.

Harbor basin, required depth of 18 feet at mean lake level, has shoaled so that the general depth is now 17½ feet in the north half of the basin and 16 feet in the south half.

PROPOSED OPERATIONS AND REMARKS.

The project for improvement is completed, except the additional channel excavation provided for conditionally by the special appropriation in the river and harbor act of June 25, 1910.

Maintenance will be required indefinitely; but repairs to maintain the pier and breakwater in fair condition, unless damaged by severe storms, can be made with funds on hand.

No estimate of funds is therefore made for the fiscal year ending June 30, 1913.

APPROPRIATIONS AND ALLOTMENTS.

For previous projects (as listed in H. Doc. No. 421, 57th Cong., 2d sess.)	$551,579.38
June 3, 1896	10,000.00
June 4, 1897	398,258.00
June 13, 1902	25,000.00
Sales and repayment	380.00
Mar. 3, 1909 (allotment Apr. 5, 1909)	5,000.00
June 25, 1910	99,275.00
Total	1,089,492.38

CONTRACTS IN FORCE.

No contracts in force.

COMMERCIAL STATISTICS, DUNKIRK HARBOR, N. Y., CALENDAR YEAR 1910.

Season of navigation.—Opened, April 12, 1910; closed, December 10, 1910.

Vessels entered and cleared.

Vessels.	Number.	Net registered tonnage.
American, registered:		
Steam	74	1,607
Barges	2	774
Total	76	2,381

No record of unregistered vessels.

Increase of tonnage, 1910 over 1909		1,186
Amount of revenue collected, year 1910, rail commerce		$5,069.31
Value of imports, rail		$18,381.00
Enrolled tonnage, port of Dunkirk, N. Y	gross tons..	755
Greatest draft of vessels	feet..	12
New lines of transportation established		None.

Receipts and shipments by lake.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
RECEIPT.				*Miles.*	*Mills.*
Gravel and sand	225 cubic yards	337	$225	40	4.150

Shipments: None.

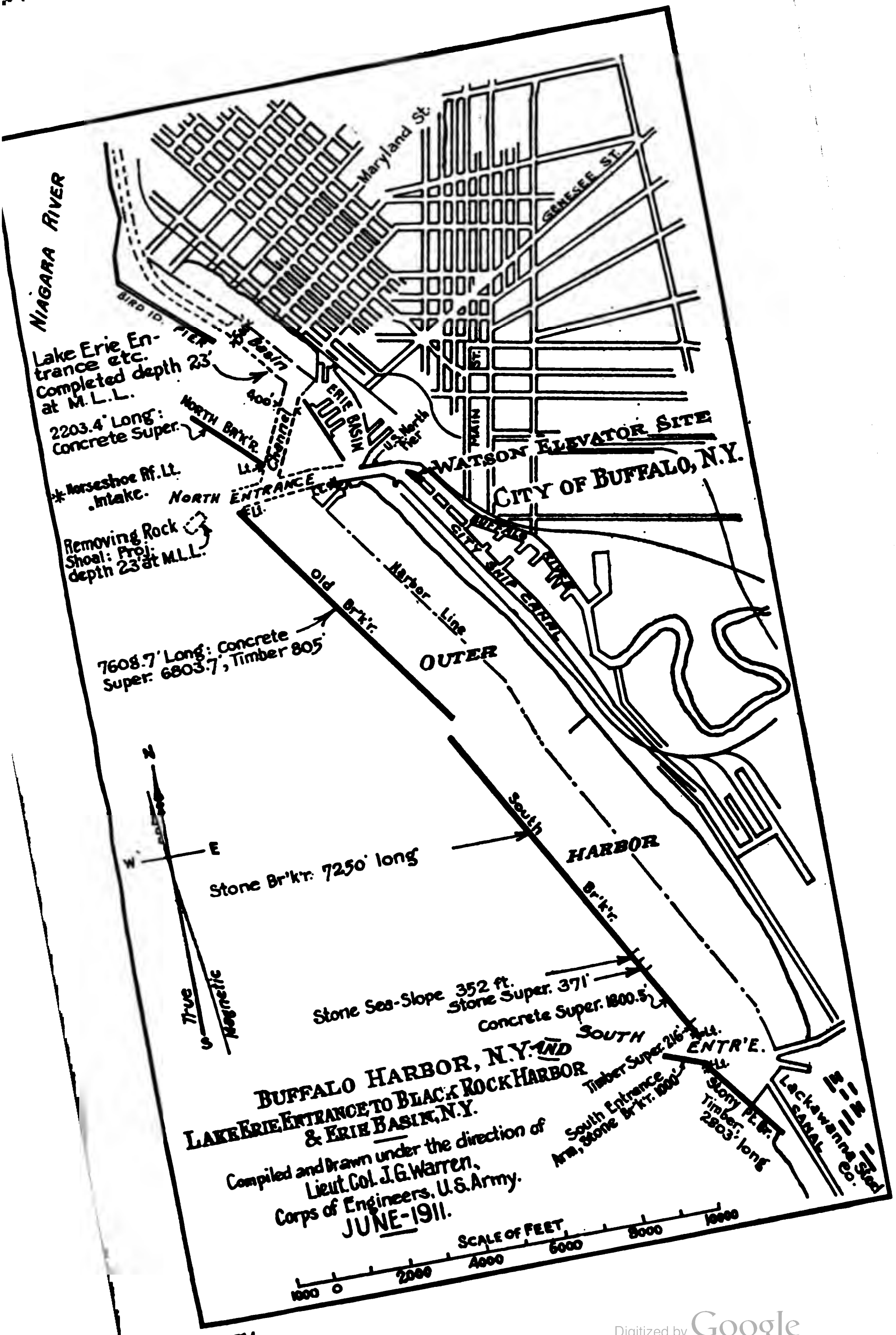
OO 3.

IMPROVEMENT OF BUFFALO HARBOR, N. Y.

REPORT OF OPERATIONS.

Extension of Stony Point section of breakwater.—Length, 1,000 feet, running in a northwesterly direction from the north end of the present Stony Point section, at an angle of 150° from the axis of said section, and built of stone; it is called the "south entrance arm."

The foundation, to a height of 12 feet below mean lake level, was made by dumping stone excavated from Lake Erie entrance to Black Rock Harbor and Erie Basin. The construction of the stone breakwater upon this foundation was begun in 1906 under contract with the Canal Quarry Co. to the extent permissible with $130,000, the amount available at the time of making the contract. Work under this contract, time limit waived, was continued during the fiscal year until April 15, 1910, when permissible work was completed. Under this contract 616 linear feet of stone structure was completed and 184 linear feet additional built to varying heights up to 12 feet above



BUFFALO HARBOR, N.Y. AND LAKE ERIE ENTRANCE TO BLACK ROCK HARBOR & ERIE BASIN, N.Y.

Compiled and Drawn under the direction of
Lieut. Col. J. G. Warren,
Corps of Engineers, U.S. Army.
JUNE-1911.

2614

water level, at a cost of $130,775.60, including contingencies and engineering.

The river and harbor act of March 2, 1907, appropriated $52,336 for this work. Under contract in force with the Breakwater Co., Cleveland, Ohio, under which it was expected to complete the breakwater arm, operations were begun May 23, 1910, and were in progress at the beginning of the fiscal year, continuing until December 7, 1910, when work was suspended for the season.

It having been found that the funds on hand were not sufficient to complete the work as planned, the sum of $15,000 was authorized by the river and harbor act of February 27, 1911, to be used from other allotments for Buffalo Harbor. Under this allotment a supplemental contract was made with the Breakwater Co., May 1, 1911, for the additional quantities of stone required, and extending the time limit for completion to October 31, 1911. Work under this supplemental contract was begun April 24, 1911, and the entire contract was completed June 29, 1911, at a cost of $58,379.14, including contingencies and engineering, making the total cost of the 1,000-foot extension $189,154.74.

Excavating shoals outside north entrance to harbor.—An appropriation of $56,100 was made by the river and harbor act of March 2, 1907, for excavating rock shoals at entrance of Buffalo Harbor to a depth of 23 feet at mean lake level.

A project for the work was forwarded and approved, and contract was made June 14, 1907, with the Lake Erie Dredging Co., the lowest bidder.

Work was begun in June, 1907, and was continued through the fiscal years 1908, 1909, and 1910; time limit waived. Slow progress was largely on account of unfavorable weather and sea.

Dredging was in progress at the beginning of the fiscal year, but the dredge was withdrawn July 5, 1910, on account of continued unfavorable weather and sea.

The dredge worked 11 scattered days in August and was withdrawn, the contract being completed with the exception of removing some rock forming shoal spots, which it was planned to remove with derrick and diver.

The derrick worked October 20, November 3 and 28, December 5, 6, 7, 11, and 13, 1910, unfavorable weather and sea preventing work at other times.

Work with derrick was resumed May 10, 1911, and was completed May 17, final examination completed June 4, 1911, at a total cost of $56,100, including engineering and contingencies.

Detailed examinations of the shoals outside of the north entrance showed the existence of a shoal area north of the main shoal, now removed, on which the depth of water is 20.7 to 23 feet at mean lake level. The removal of this shoal to 23 feet depth at mean lake level, necessary to provide a safe channelway for large vessels making the turn at this entrance, and estimated at $37,400, is authorized, and the funds provided by the special appropriation in the river and harbor act of June 25, 1910. Specifications for this work have been prepared, combined with those for removing the Watson Elevator site, which work is being delayed by the failure of the city of Buffalo to transfer the site to the United States in accordance with the provisions of the act.

Miscellaneous.—The inspection steamer *Thomas Lincoln Casey* was on duty throughout the year on the inspection of operations on harbor works, on the care of floating plant, and on the enforcement of laws for the protection of navigation, notably the dumping of dredgings.

A watchman was on duty throughout the year at the United States engineer storehouse on the south pier for the care of public property, and he also acted as ferryman for employees and supplies to and from the storehouse, and had charge of the automatic water gauge.

The north pier at the entrance to Buffalo River, occupied by the Delaware, Lackawanna & Western Railroad Co., is the only one of the Government harbor works permanently occupied by corporations or private parties.

The occupancy was begun in 1878. A history of this occupancy and copies of official documents relating thereto are given in the Annual Report of the Chief of Engineers for 1889, pages 2373–2383; for 1898, pages 2775 et seq; and for 1904, pages 3258 and 3259.

CONDITION OF THE WORKS.

At the close of the fiscal year the condition of the works was as follows:

North entrance piers.—These works, forming the entrance to the inner harbor, which comprises Buffalo Creek and city ship canal, were in fair condition.

The north pier, still in the possession of the Delaware, Lackawanna & Western Railroad Co., is a timber crib structure and is kept in repair by the railroad.

The south pier has a concrete superstructure for its full length and is in good condition.

Breakwater system.—This system comprises four sections of breakwater separated by three entrance channels.

The north breakwater, 2,203 feet long, is a permanent concrete structure and is in good condition.

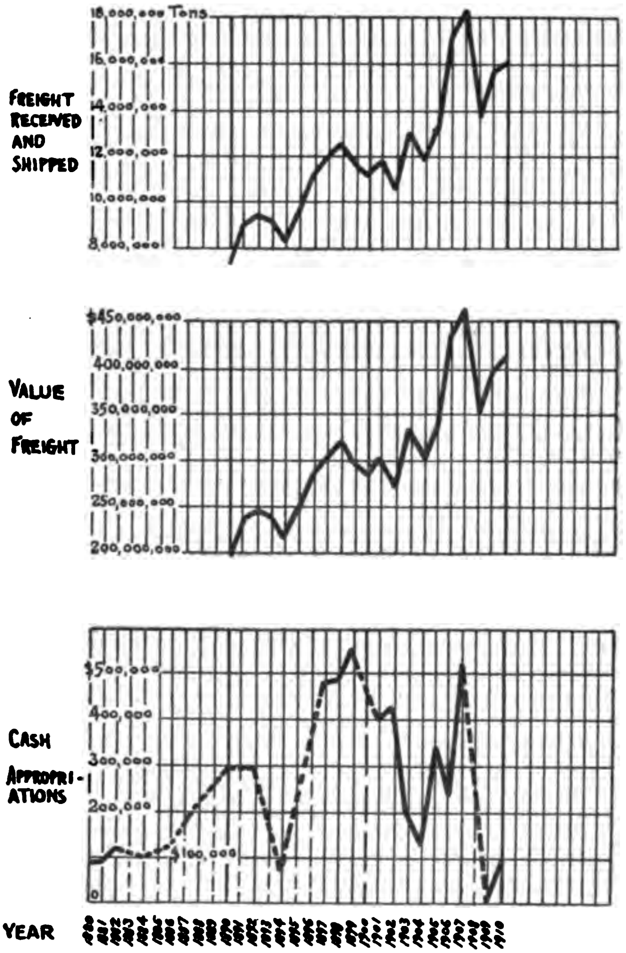
The old breakwater, 7,608 feet long, of which 4,894 feet is in permanent concrete form, 1,910 feet in stone-concrete form, and 804 feet in timber cribwork. This section needs heavy riprap along the lake face.

The south harbor breakwater is 9,989 feet long. The northerly 7,250 feet is of rubblestone type, a permanent form. The next 360 feet is of timber crib with stone sea slope, and the adjoining 363 feet of timber crib with stone superstructure and sea slope. Following is 1,800 feet of timber crib with concrete superstructure, and the southerly 216 feet is timber crib with timber superstructure. All is in good condition, but needs heavy riprap along the lake face of the timber-concrete portion.

The Stony Point breakwater is 2,803 feet long, connecting with the shore, of timber-crib type, with an arm extending lakeward 1,000 feet to protect south harbor entrance, rubblestone type. This section is in fair condition, but needs heavy riprap along the lake face of the timber-crib portion.

The condition of the north entrance channel, between the piers, the outer harbor, and the north entrance and south entrance, are as stated in the summary report.

BUFFALO HARBOR, N.Y.



PROPOSED OPERATIONS AND REMARKS.

It is proposed during the next fiscal year to make minor repairs and place riprap along the old, South Harbor, and Stony Point sections of the breakwater; to widen the Buffalo River entrance channel outside the piers to 400 feet, and remove a rock area at its inner end; to remove the Watson elevator site and make additional excavation of rock shoals outside of the north entrance; all to the depth of 23 feet at mean lake level.

Funds on hand will complete the project for improvement.

Maintenance will be required indefinitely; but funds on hand for "repairing and rebuilding breakwaters" and "outer harbor and maintenance of structures and channels" are considered sufficient, and no estimate is therefore made for the fiscal year ending June 30, 1913.

ALLOTMENT AND APPROPRIATIONS.

For previous projects (as listed in H. Doc. 421, 57th Cong., 2d sess.)	$2,837,995.37
June 4, 1897	481,250.00
July 1, 1898	489,746.00
Mar. 3, 1899	485,498.00
Mar. 3, 1899	75,000.00
Mar. 3, 1901	400,000.00
June 13, 1902	30,000.00
June 28, 1902	200,000.00
Mar. 3, 1905	$150,000.00
Mar. 3, 1905	143,506.00
Mar. 2, 1907	533,436.00
Mar. 3, 1909	3,264.44
June 25, 1910	99,605.00
Received from other sources	1,395.15
Total	5,930,695.96

COMMERCIAL STATISTICS, BUFFALO HARBOR, N. Y., CALENDAR YEAR 1910.

Season of navigation.—Opened, April 12, 1910; closed, December 10, 1910.

Vessels entered and cleared.

Vessels.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Registered:					
Steam	5,373	621	5,994	13,980,866	1,756,056
Sail and barges	356	787	1,143	444,231	....
Total	5,729	1,408	7,137	14,425,097	1,756,056

No record of unregistered vessels.

Increase of tonnage, 1910 over 1909		253,710
Amount of revenue collected, year 1910:		
Lake commerce	$573,338.66	
Rail commerce	855,444.72	
		$1,428,783.38
Value of imports:		
By lake	$4,945,399.00	
By rail	4,278,488.00	
		$9,223,887.00
Value of exports:		
By lake	$2,002,197.00	
By rail	36,606,986.00	
		$38,609,183.00
Enrolled tonnage, port of Buffalo, N. Y.	gross tons	277,432
Greatest draft of vessels	feet	20

New lines of transportation established: None.

Receipts and shipments by lake.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
RECEIPTS.				*Miles.*	*Mills.*
Broom corn	43,566 bales	6,535	$522,792	889	6.524
Canned goods	11,704 cases	351	46,816	889	3.150
Cereal goods	91,571 cases	2,060	183,142	889	2.025
Coal, bituminous	8,665 tons	9,705	18,197	240	4.167
Cooperage	2,827 tons	2,827	56,540	705	3.121
Copper	119,183 tons	119,183	29,795,750	900	2.222
Corn meal	50 barrels	5	125	889	2.025
Cotton	21,445 bales	5,361	1,608,375	889	5.000
Feed	2,178,320 sacks	163.374	3,594,228	889	2.025
Fish	1,736 tons	1.736	260,400	300	16.667
Glucose	136,980 barrels	45,888	1,835,532	889	3.150
Grain and flour:					
Barley	11,930,453 bushels	286,330	10,140,885	954	.545
Corn	22,659,676 bushels	634.471	12,689.418	884	.407
Oats	12,326,131 bushels	197,218	4,437,407	875	.720
Rye	348,383 bushels	9,754	296.125	975	.462
Wheat	49,537,246 bushels	1,486,117	50,527,991	921	.402
Flax	4,594,467 bushels	128,645	12,634,784	918	.490
Flour	7,133,570 barrels	713,357	36,381,207	899	2.247
Hair	1,050 bales	26	788	889	3.150
Hides	1,396 bundles	35	6,980	889	3.599
Iron ore	4,397,285 tons	4,924,959	17,149,411	878	.752
Lath	1,700,000 pieces	425	5,525	900	2.222
Lead	10,771 pigs	592	53,316	889	2.474
Lead, white	2,726 cases	68	6,134	889	2.474
Lumber	117,136,000 feet b. m.	204,988	2,342,720	900	1.433
Malt	6,200 bushels	149	7,564	824	2.184
Merchandise	154,220 tons	154.220	23,133,000	800	3.500
Oil cake	64,056 sacks	9,608	288,252	889	2.474
Peas	117,935 bushels	3,538	265,354	824	2.184
Posts	10,000	250	5,000	900	1.433
Pig iron	98,068 long tons	109,836	1,716,190	733	2.387
Pelts	3,270 bundles	654	130,800	889	3.150
Rags	18,055 bales	4,514	225,688	800	3.000
Rubber	8,294 bales	622	74,646	800	3.000
Seed, grass	111,805 bags	5,590	670,830	850	3.294
Sandpaper	135 tons	135	13,500	889	3.150
Shingles	590,850,000	106,353	1,772,550	900	1.389
Spelter	5,100 plates	140	16,830	889	1.800
Sirup	28,092 barrels	9,481	280,920	889	3.150
Starch	412,053 boxes	12,361	618,080	889	2.025
Tallow	1,044 barrels	175	24,555	889	3.150
Vinegar	5,337 barrels	1.201	24,017	889	3.150
Wool	130,320 sacks	19.548	11,728,800	910	5.714
Total		9,382,385	225,591,164		
SHIPMENTS.					
Cement	2,895,510 barrels	550,147	4,343,265	900	2.167
Coal, hard	3,639,368 tons	3,639,368	20,016,524	834	.420
Manufactured iron and steel	88,409 tons	88,409	2,475,452	997	.903
Salt	469,509 barrels	70,426	422,558	892	.504
Sugar	1,179,070 barrels	206,337	20,633,725	889	3.375
Unclassed freight	818,645 tons	818,645	122,796,750	800	2.250
Total [1]		5,373,332	170,688,274		

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[1] From Monthly Summary of Commerce and Finance, 1910, Bureau of Statistics, Department of Commerce and Labor.

The following statistics of the canal commerce of Buffalo for the year 1910 are furnished by the superintendent of public works, State of New York:

Canal clearances	2,062
Freight received, Buffalo (649,471 short tons), valuation	$18,542,775
Freight shipped, Buffalo (885,235 short tons), valuation	$16,912.769
Steamers and canal boats navigating from Buffalo on canal, about	500
Average freight rate, Buffalo to New York, for wheat, per bushel	$0.04

Assuming that the number of arrivals of canal boats equaled the number of clearances, the grand total of the commerce of Buffalo by lake and canal for the calendar year 1910 is as follows:

	Arrivals and departures.	Receipts of freight.	Shipments of freight.
	Vessels.	*Short tons.*	*Short tons.*
Lake	7,137	9,382,385	5,373,332
Erie Canal	4,124	649.471	885,235
Total	11,261	10,031,856	6,258,567

Total receipts and shipments, 16,290,423 short tons; total valuation, $431,784,982.

O O 4.

IMPROVEMENT OF BLACK ROCK HARBOR AND CHANNEL, N. Y.

REPORT OF OPERATIONS.

Work was continued during the fiscal year under contracts in force as follows:

Empire Engineering Corporation.—Excavation of 6,300 linear feet, more or less, of the channel, beginning at the south end, station 0 to 63. Estimated amount of contract, $664,000.

Excavation was continued from July 1 to December 10, 1910, when the plant was laid up for the winter, 2 dredges working through the season, 2 rock breakers to September 1 and 1 to October 4, 2 drill boats to September 30, and 1 to close of season.

Operations were resumed April 15, 1911, with 1 drill boat and 2 dredges, working to the end of the fiscal year.

During the fiscal year 13,970 cubic yards of material overlying bedrock and 114,051 cubic yards of bedrock, place measure, were excavated, and at its close the channel had been excavated for full width, except cleaning up, from stations 0 to 46 and stations 53 to 63, total 5,600 linear feet, and partly excavated for the remaining 700 linear feet. The canal wall had been removed for the length of 1,145 feet out of a total of about 1,200 linear feet required. The work was about 93 per cent completed.

A survey of the excavation completed in 1910 was made January-February, 1911, and showed an excavation more than that previously estimated for in monthly payments, amounting to $43,301.55. This amount was paid to the contractors under paragraph 71 of the specifications.

The contractors should have completed the work December 31, 1908, and earned approximately $664,000. The actual earnings to the close of the fiscal year were $623,269.79.

Buffalo Dredging Co.—Excavation of 3,400 linear feet, more or less, of the channel to Ferry Street Bridge, stations 63 to 97. Estimated amount of contract, $675,000.

At the beginning of the fiscal year the work was completed except the trunk sewer section, 200 linear feet, which could not be excavated until the sewer obstructing the channel was removed by the city of

Buffalo, as required by order of the Secretary of War dated August 3, 1909.

Under a supplemental contract the channel was to be completed within six months after removal of the sewer and written notice to the contractor under paragraph 39 of the specifications.

This written notice was given March 24, 1911, and work was started with 1 drill boat and 1 dredge March 28, 1911. The drilling and blasting of rock was completed May 9 and the dredging of blasted rock June 14, 1911.

The whole work under this contract was completed at a total cost of $688,467.43, including engineering and contingencies.

MacArthur Bros. Co.—Construction of concrete walls for ship lock. Estimated amount of contract, $823,304.45.

At the beginning of the fiscal year work was being done on section 6 of concrete walls, comprising the upper gate space walls and sill, 127 linear feet, the last to be built, and about half of the base had been completed.

The cofferdam inclosure was maintained unwatered to bedrock and to the depth of the uncompleted excavation, 37½ to 42 feet below mean river level, by practically continuous operation of the 15-inch pump and intermittent operation of the 12-inch and 20-inch pumps. The flow from leaks north of section 6 was directed to the 20-inch pump on the intermediate lock-gate sill, and the flow from two large leaks in section 6 was diverted by iron pipes to the 12-inch and 15-inch pumps.

Placing concrete in section 6 was completed August 31 and forms removed and contractor's plant moved, so that pumping was finally stopped on October 8.

During October, November, and part of December, 1910, the contractor was leveling clay and earth fill over rock in the lock chamber, removing plant, and cleaning up the work, which was completed December 7, 1910.

Total cost of contract, including office and engineering expenses, $828,697.70.

The contractor signed the final voucher under the following protest:

> Accepted under protest, without waiving or prejudicing the right of the payee to additional amounts claimed, as follows:

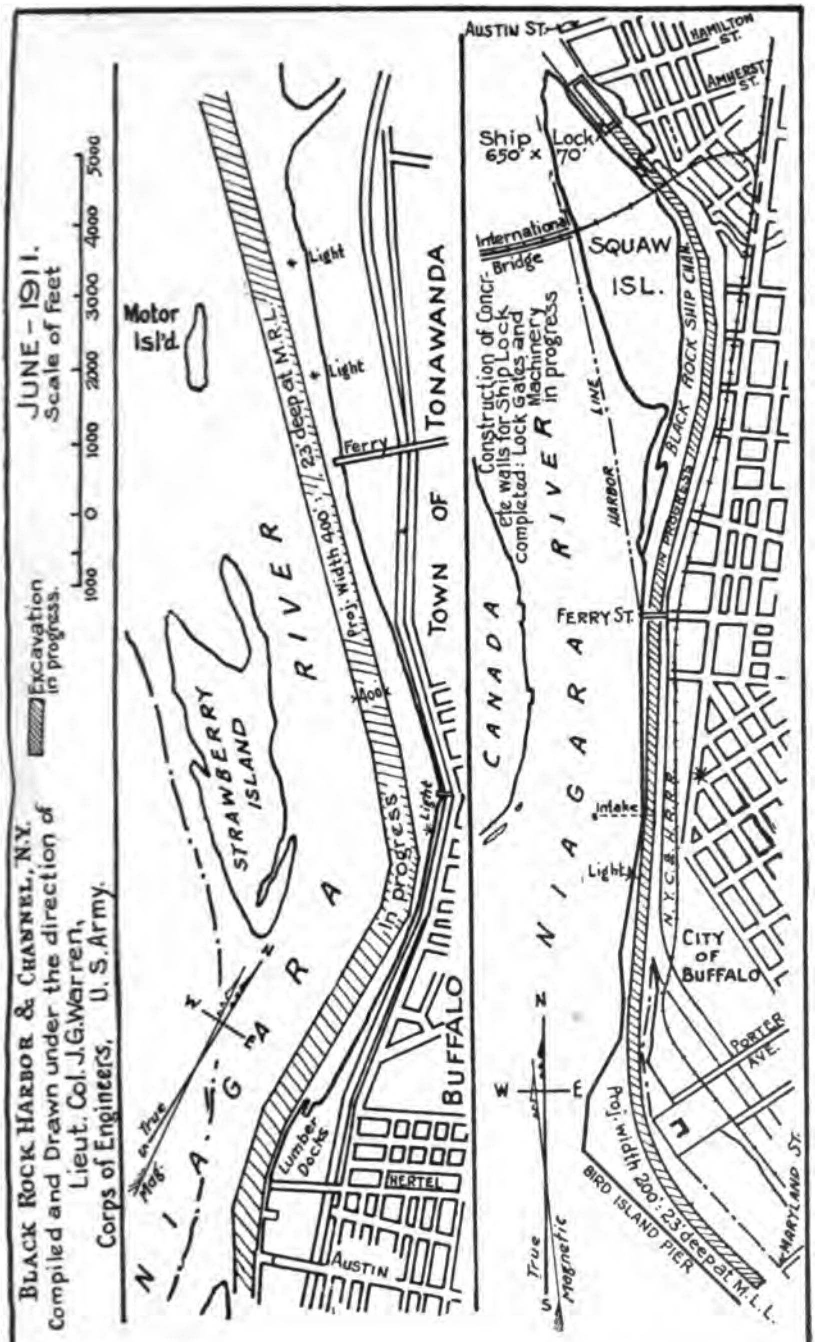
Pumping, etc., under paragraph 52 of specifications	$57,180.32
Moving riprap stone	3,370.73
	60,551.05

The amount for "moving riprap stone" was paid to the contractor December 27, 1910, under authority of the Chief of Engineers.

The balance of the claim, corrected and reduced by the contractor to $44,536.94, is under investigation.

D'Olier Engineering Co.—Contract dated August 15, 1910, for steel lock gates, valves, and machinery for Black Rock ship lock; amount, $146,984. Supplemental contract dated October 7, 1910, provides for alteration of pumping plant by adding a suction pipe direct-connected to the pumps; amount, $1,200. Contracts to be completed June 30, 1912.

Work was commenced September 21, 1910, placing 30-inch valve and suction elbow on pump-well inlet pipe; completed October 7, 1910.



BLACK ROCK HARBOR & CHANNEL, N.Y.
Compiled and Drawn under the direction of
Lieut. Col. J.G. Warren,
Corps of Engineers, U.S. Army.

JUNE – 1911.

Responsibility for and maintenance of cofferdam was assigned to contractor November 23, 1910, under paragraph 36 of specifications.

Work on construction of steel lock gates and Stoney valves was begun at Buffalo, and of pumping plant at Philadelphia, during October, 1910, and the construction of other parts of the required installations, electric motors, etc., was begun at shops in other cities and towns. All shop construction was continued during the winter months and the completed parts shipped to the lock.

The installation of the pumping plant was begun March 26, 1911, and the pumps were ready for pumping out the cofferdam inclosure June 5, when pumping began. The inclosure was unwatered to 1 foot below lower gate sill level in 33 hours continuous operation of the 12-inch and 20-inch pumps, about 25,000,000 gallons of water having been pumped at lifts increasing from 2 to 25 feet.

Maintenance of the inclosure unwatered to below lower gate sill level was continued to the close of the fiscal year by operation, at reduced speed, of the 20-inch pump.

The pumping plant and all of its accessories were completed June 29, 1911.

The placing of oak miter sills for the upper guard gate was begun June 7, and the placing of the steel gate leaves for this gate on June 26. This work was in progress at the close of the fiscal year.

BLACK ROCK SHIP LOCK.

Summary of materials placed and work done and accepted, with cost, exclusive of engineering contingencies, to July 1, 1911.

Items.	Unit measure.	Quantities.	Contract price.	Total.
Contract—MacArthur Bros. Co.:				
Cofferdam, lock walls, and installations therein, as per report for fiscal year 1910				$691,253.95
Cofferdam—				
Clay filling	Cubic yards	100	$0.45	45.00
Pumping and maintenance	Lump		8,000.00	8,000.00
Stopping leaks, paragraph 52, contract specifications				2,564.15
Removing stone embankment inside cofferdam				3,370.34
Lock walls—				
Concrete	Cubic yards	17,678.10	4.37	77,253.29
Granite for quoins	do	129.06	60.00	7,743.60
Steel culverts—				
72-inch	Linear feet	200.40	15.65	1,727.76
Inlets, 30-inch	do	107.21	8.65	927.37
Steel I beams and channels	Pounds	11,848	.05	592.40
Cable pipe, lapwelded	do	6,390	.10	639.00
Cast steel pivot bases	Number	4	100.00	400.00
Steel eyebars	do	16	65.70	1,051.20
Anchorage bolts	Pounds	5.452	.05	272.60
Mooring posts	Number	2	40.00	80.00
Total, MacArthur Bros. Co				795,920.66
Contract—D'Olier Engineering Co.:				
Pumping plant	Lump		9,600.00	9,600.00
Grand total				805,520.66

Arthur H. Vogel.—Contract dated August 25, 1910, for excavation in Niagara River section of Black Rock Harbor and Channel, extending from the foot of the ship lock downstream 17,300 feet more or less to deep water in Niagara River, the channel to be 23 feet deep at mean river level and 400 feet wide at bottom. Total estimate, $532,100. Work to be completed June 30, 1912.

Excavation was commenced in the section immediately below the ship lock with one dredge September 7, and a second dredge was placed on the work September 23, 1910. Rock drilling across Strawberry Island Reef, 3,300 linear feet, was commenced October 17, 1910, with one drill boat and continued until November 11, 1910, when drilling was suspended for the season. Dredging continued until December 17, 1910, when the entire plant was laid up for the season.

"End of season" survey required by paragraph 55 of specifications was completed January 20, 1911, and underpayment during 1910 found to be $7,044.18, which was paid to the contractor under paragraph 56 of specifications.

Dredging was resumed on the section immediately below the ship lock with two dredges on May 8, 1911, and continued to the end of the fiscal year, the total amounts excavated being 555,520 cubic yards, place measure, material overlying bedrock, and 2,281 cubic yards, place measure, bedrock; 5,600 linear feet of channel, from the ship lock to Strawberry Island Reef, completed; rock excavation across Strawberry Island Reef, 3,300 linear feet, only begun; channel below the reef, 8,400 linear feet, 50 per cent completed.

Great Lakes Dredge and Dock Co.—Contract dated March 31, 1911, for excavation of north section of Black Rock Harbor from Ferry Street Bridge to the ship lock, removing Ferry Street Bridge pier, old State lock and middle wall between Black Rock Harbor and Erie Canal, the channel to be 200 feet wide at bottom and 23 feet deep. Estimated amount of contract $306,200. Work to be completed December 31, 1912.

Work was commenced May 15, 1911, with one derrick removing stone from middle wall. One dredge began removing wall and earth excavation on May 24; a second dredge began June 30, and both continued to the close of the fiscal year, when 33,841 cubic yards, place measure, material overlying bedrock; 280 linear feet of middle wall had been removed, and 569 tons stone removed from middle wall and placed on Bird Island Pier with derrick. No channel completed.

Buffalo Dredging Co.—Contract dated April 6, 1911, for excavation of Bird Island section of Black Rock Harbor, approximately 500 feet long, 100 feet wide, and 23 feet deep, being a section opposite Fort Porter, N. Y., left unexcavated under the contract with the Empire Engineering Corporation.

The work also involves the removal of about 300 linear feet of the Bird Island Pier and the construction, by deposit of material excavated from the channel and from the pier to be removed, of rubble mound pier to replace it. Estimated amount of contract $43,250. To be completed December 31, 1911.

Preliminary work was commenced May 15, 1911; drilling and blasting rock with one drill boat June 2 and excavation with two dredges June 6. At the close of the fiscal year the trench for new section of Bird Island Pier had been excavated complete and rubble stone hearting for the new pier placed therein ready for placing capping stone. Drilling and blasting rock was in progress; 3,433 cubic yards of material overlying rock and 2,974 cubic yards blasted rock, all place measure, had been excavated.

Minor repairs to Bird Island Pier.—At the beginning of the fiscal year repairing breaks in the pier was in progress, being done by day labor and hired scow. Stone replaced in breach at station 25 to 26 with hired dredge and at old mill race, 650 feet north of Ferry Street, by hired labor.

During April, 1911, the break at the old mill race was entirely closed and the sheet-pile bulkhead, 1,790 feet north of Ferry Street, was repaired.

Total cost of repairs to pier during the fiscal year, $1,674.10.

PROPOSED OPERATIONS AND REMARKS.

Funds on hand will cover existing contracts for steel lock gates and operating machinery, the completion of all of the channel above the ship lock and new pier required at the elbow in Bird Island Pier, the excavation of all of the channel in Niagara River below the ship lock, and will also cover the construction of wing walls for the ship lock and the new bascule bridge across the channel at Ferry Street.

Further work to complete the project comprises electric power and lighting installations and guide piers for the ship lock, removal of cofferdam, the completion of lock grounds and buildings, and general repair of Bird Island Pier.

In order to advance this work most advantageously, with a view to completing the channel and the shiplock ready for use at the same time, it is recommended that the $300,000 authorized by the river and harbor act of June 25, 1910, be appropriated for the fiscal year ending June 30, 1913.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $300,000.00

APPROPRIATIONS.

For previous projects (as listed in H. Doc. No. 421, 57th Cong., 2d sess.)	$52,098.00
Mar. 3, 1905	100,000.00
June 30, 1906	233,000.00
Mar. 2, 1907	1,000,000.00
Mar. 4, 1907	367,000.00
Mar. 4, 1909	1,000,000.00
June 25, 1910	1,000,000.00
Feb. 27, 1911	400,000.00
Sales and collections	322.25
Total	4,152,420.25

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[1] Exclusive of the balance unexpended July 1, 1911.

CONTRACTS IN FORCE.

FOR EXCAVATION IN BLACK ROCK HARBOR, N. Y., DATED FEBRUARY 1, 1906.

Name of contractor: Empire Engineering Corporation, New York.
Rates:

Removing material overlying bed rock, per cubic yard, place measure	$0.33
Removing bed rock, per cubic yard, place measure	1.85
Removing partition wall, per linear foot	9.00
Handling rock with derrick, per ton	.90

Date of approval: March 6, 1906.
Date of commencement: November 5, 1906.
Date of expiration: December 31, 1908.
Time limit waived.

FOR EXCAVATION IN BLACK ROCK HARBOR, N. Y., DATED AUGUST 25, 1910.

Name of contractor: Arthur L. Vogel, Milwaukee, Wis.
Rates:

Removing material overlying bed rock, per cubic yard, place measure	$0.22
Removing bed rock, per cubic yard, place measure	2.05
Handling rock with derrick, per cubic yard, bucket measure	1.50

Date of approval: September 1, 1910.
Date of commencement: September 7, 1910.
Date of expiration: June 30, 1912.

FOR EXCAVATION IN NORTH SECTION, BLACK ROCK HARBOR, N. Y., DATED MARCH 31, 1911.

Name of contractor: Great Lakes Dredge & Dock Co., Chicago, Ill.
Rates:

Removing material overlying bed rock, per cubic yard, place measure	$0.15
Removing bed rock, per cubic yard, place measure	2.30
Removing wall, per linear foot	3.50
Handling rock with derrick, per ton	1.00
Removing Ferry Street Bridge pier, for all	3,000.00
Removing old lock, for all	10,000.00

Date of approval: April 11, 1911.
Date of commencement: May 15, 1911.
Date of expiration: December 31, 1912.

FOR EXCAVATION IN BIRD ISLAND SECTION, BLACK ROCK HARBOR, N. Y., DATED APRIL 6, 1911.

Name of contractor: Buffalo Dredging Co., Buffalo, N. Y.
Rates:

Removing material overlying bed rock, per cubic yard, place measure	$0.30
Removing bed rock, per cubic yard, place measure	2.10
Handling and placing capping stone, per ton	1.10

Date of approval: April 11, 1911.
Date of commencement: May 15, 1911.
Date of expiration: December 31, 1911.

FOR CONSTRUCTION AND ERECTION OF STEEL LOCK GATES, VALVES, AND OPERATING MACHINERY, DATED AUGUST 15, 1910.

Name of contractor: D'Olier Engineering Co., Philadelphia, Pa.
Rates:

Miter sills, each	$300.00
Guard gates, each	16,000.00
Lock gates, each	18,300.00
Cable gate-operating machines, each	1,625.00
Plow steel cable, for all	500.00
Vertical cable sheaves, each	35.00
Horizontal cable sheaves, each	100.00
Cable counterweights, each	55.00

Stoney culvert valves, each	$2,042.00
Pumping plant, for all	8,400.00
Capstans, each	1,338.00
By-pass valves, each	425.00
Drain pipe valves	150.00
Cofferdam pumping and maintenance, for all	12,000.00

Date of approval: August 18, 1910.
Date of commencement: September 21, 1910.
Date of expiration: June 30, 1912.

Supplemental to the above, for adding to the pumping plant a suction pipe directly connected to the pumps, dated October 7, 1910:

Name of contractor: D'Olier Engineering Co., Philadelphia, Pa.
Rate: For all, $1,200.
Date of approval: October 14, 1910.
Date of commencement: October 14, 1910.
Date of expiration: June 30, 1912.

COMMERCIAL STATISTICS.

For commercial statistics, see report on Buffalo Harbor and on Tonawanda Harbor and Niagara River, N. Y.

O O 5.

IMPROVEMENT OF TONAWANDA HARBOR AND NIAGARA RIVER, N. Y.

REPORT OF OPERATIONS.

No work was done during the year.

PROPOSED OPERATIONS AND REMARKS.

No work is proposed for the next fiscal year.

The channel of the project is completed, except through the "rapids" at the Buffalo waterworks intake crib, where the width of the channel is about 100 feet; and from Tonawanda Iron & Steel Co.'s docks to the north line of North Tonawanda, where the depth is 12 to 15 feet. The "rapids" channel will be superseded by the Black Rock Channel and shiplock, now approaching completion and improvement below the Tonawanda Iron & Steel Co.'s docks is not urgent. Sufficient funds are on hand for maintenance; no estimate is therefore made for the fiscal year ending June 30, 1913.

APPROPRIATIONS.

For previous projects (as listed in H. Doc. No. 421, 57th Cong., 2d sess.)	[1] $6,500.00
Aug. 11, 1888	100,000.00
Sept. 19, 1890	75,000.00
July 13, 1892	75,000.00
Aug. 18, 1894	50,000.00
June 3, 1896	50,000.00
Mar. 3, 1899	75,000.00
June 13, 1902	257,700.00
Mar. 2, 1907	3,000.00
Received from other sources	331.42
Total	692,531.42

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[1] $587.52 turned into Treasury June 30, 1890.

COMMERCIAL STATISTICS.

Season of navigation.—Calendar year 1910: Opened, April 12, 1910; closed, December 10, 1910.

Vessels entered and cleared.

Registered vessels.	American.	Foreign.	Total.	Net registered tonnage.
Buffalo Creek district:				
Steam	42	100	142	36,921
Sail and barges	99	115	214	97,293
Niagara district:				
Steam	557	93	650	539,540
Sail and barges	397	93	490	401,739
Total	1,095	401	1,496	1,075,493

No record of unregistered vessels.

Passengers carried on—	
Excursion steamers	98,627
Ferry steamers	475,877
Decrease of tonnage, 1910 under 1909	83,814
Amount of revenue collected, year 1910:	
Lake commerce	$95,407.54
Rail commerce	$3,305.76
Value of imports:	
Lake	$1,846,211.49
Rail	$35,254.71
Value of exports, lake	$9,076.00
Enrolled tonnage, port of North Tonawanda, N. Y.........gross tons..	72,789
Greatest draft of vessels.........feet..	15
New lines of transportation established	None.

Receipts by lake and river.

Article.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Mills.*
Cordwood	5 cords	10	$50	....	....
Iron ore	325,099 long tons	364,111	1,267,886	890	0.955
Lath	6,324,550 pieces	1,581	20,555	900	2.222
Lumber	303,270,782 feet b. m.	530,899	6,067,416	900	1.433
Pig iron	4,968 long tons	5,559	86,852	745	2.684
Posts, cedar	93,895 pieces	2,347	46,948	900	1.667
Railroad ties	250 pieces	19	375	....	....
Sand	1,650 cubic yards	2,475	2,063	10	....
Shingles	241,000 pieces	43	723	900	1.389
Totals	....	907,044	7,492,868	....	....

Shipments.

	Quantity.	Value.
Shipments by lake and river	None.	None.
Shipments by Erie Canal.........short tons..	[1] 207,567	$2,739,366
Lumber shipments by Erie Canal (included in above).........feet b. m..	[1] 81,507,919	2,445,238
Receipts by Erie Canal.........short tons..	[1] 42,251	105,628

[1] Furnished by New York State superintendent of public works.

Number of vessels passing International Bridge, Niagara River, 1910.

[Furnished by R. J. McMurray, captain of the tug *International*.]

Steamers	5,142
Other vessels	1,295
Total	6,437
Season of navigation, April 1, 1910, to January 1, 1911 ... days	275
Number of times bridge draw was opened during season	3,780
Average number of times bridge was opened per day	13.7

O O 6.

IMPROVING NIAGARA RIVER, N. Y.

[Completing channel across Cayuga Island Shoal, H. Doc. 75, 60th Cong., 1st sess.]

REPORT OF OPERATIONS.

No work was done on the Niagara River from Tonawanda to Niagara Falls from December, 1900, when funds were exhausted, to June 4, 1911, when preparatory work for completing channel across Cayuga Island Shoal was started, $10,000 having been provided for this work by the river and harbor act of June 25, 1910.

A contract was made with the Buffalo Dredging Co., which involves the removal of approximately 9,000 cubic yards, scow measure, of earth and blasted rock to complete the channel to its project width of 200 feet, 12 feet deep, to be completed September 4, 1911.

Excavation was started June 26, 1911, with one dredge and at the close of the fiscal year had progressed so as to assure its completion in July, 1911.

The funds appropriated by the river and harbor act of June 25, 1910, will complete the project, and as funds for maintenance are not considered necessary, no estimate is made for the fiscal year ending June 30, 1913.

APPROPRIATIONS.

July 13, 1892	$20,000
Aug. 18, 1894	10,000
June 3, 1896	15,000
Mar. 3, 1899	15,000
June 25, 1910	10,000
Total	70,000

CONTRACT IN FORCE.

For excavation at Cayuga Island Shoal.
Name of contractor: The Buffalo Dredging Co.
Rate: Excavating channel, per cubic yard, scow measure, $0.78.
Date of approval: May 1, 1911.
Date of commencement: June 4, 1911.
Date of expiration: September 4, 1911.

COMMERCIAL STATISTICS.

Season of navigation.—Calendar year 1910: Opened, May 1, 1910; closed, December 10, 1910.

The freight business using the channel consists of raw materials carried on canal boats of 6 to 8 feet draft, towed by tugs from the Erie Canal at Tonawanda to Schlosser's Dock. The passenger business consists of excursions from Buffalo on steamers of 6 to 8 feet draft, usually accompanied by a picnic barge of 2 to 4 feet draft towed alongside. During the season of about four months, June to September, from one to five of these vessels daily carry parties down the American channel, around the foot of Grand Island and return to Buffalo by the Canadian channel; occasionally a party is landed at Schlosser's Dock. Passengers carried in 1910, 98,627.

The collector of customs reports no arrivals or departures of vessels at Schlosser's Dock, Niagara Falls, for the calendar year 1910.

The principal commerce of the port is the receipt of pulp wood for the paper mills of Niagara Falls. This pulp wood comes partly from American ports and partly from Canadian ports on the Great Lakes. It is brought down the Canadian channel on lake vessels to the foot of Grand Island, where it is made into sack rafts and towed across the main channel to Schlosser's Dock. Here the rafts are opened, and the sticks floated through a runway down the river past Gill Creek into a boom, from which they are conveyed to the paper mills by an endless-chain carrier.

The following statistics relate to this pulp-wood traffic:

Vessels entered and cleared.

Registered vessels.	American.	Foreign.	Total.	Net registered tonnage.
Steam	46	87	133	58,111
Sail and barges	54	19	73	49,237
Total	100	106	206	107,348

No record of unregistered vessels.

Increase of tonnage, 1910 over 1909	16, 118
Amount of revenue collected, year 1910:	
Lake commerce	$136. 77
Rail commerce	None.
Value of imports:	
Lake	$350, 000
Rail	None.
Value of exports:	
Lake	None.
Rail	None.
Enrolled tonnage, port of Niagara Falls, N. Y. gross tons	85
Greatest draft of vessels feet	10
New lines of transportation established	None.

Receipt by lake and river.

Pulp wood (46,737 cords) short tons	93, 474
Valuation	$396, 873. 81
Average haul or distance freight was carried miles	675
Rate per ton-mile mills	2. 66

APPENDIX P P.

IMPROVEMENT OF RIVERS AND HARBORS IN THE OSWEGO, N. Y., DISTRICT.

REPORT OF CAPT. W. L. GUTHRIE, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Olcott Harbor, N. Y.	5. Harbor at Little Sodus Bay, N. Y.
2. Harbor at Charlotte, N. Y.	6. Harbor at Oswego, N. Y.
3. Harbor at Pultneyville, N. Y.	7. Harbor at Cape Vincent, N. Y.
4. Harbor at Great Sodus Bay, N. Y.	8. Harbor at Ogdensburg, N. Y.

United States Engineer Office,
Oswego, N. Y., July 15, 1911.

Sir: I have the honor to forward herewith annual reports of river and harbor works in this district for the fiscal year ending June 30, 1911.

Very respectfully,

W. L. Guthrie,
Captain, Corps of Engineers.

The Chief of Engineers, United States Army.

P P 1.

IMPROVEMENT OF OLCOTT HARBOR, N. Y.

REPORT OF OPERATIONS.

No work was done during the fiscal year. The piers are badly decayed, and the channel is not stable.

The sum of $1,500 was allotted June 8, 1911, from the emergency appropriation provided by the river and harbor act of March 3, 1905. With this money it is proposed to repair the superstructure of both east and west piers where most necessary.

No estimate of funds is made for the fiscal year ending June 30, 1913.

APPROPRIATIONS.

To June 30, 1902, as per H. Doc. 421, 57th Cong., 2d sess	$178,000.00
June 8, 1911, allotment	1,500.00
	179,500.00

P P 2.

IMPROVEMENT OF HARBOR AT CHARLOTTE, N. Y.

REPORT OF OPERATIONS.

Dredging to restore the channel between the piers to the width and depth of the project of March 2, 1897, was completed July 31, 1910. This work was begun March 28, 1910.

There were removed 9,850 cubic yards, scow measure, of sand, silt etc., at a cost of 11.6 cents per cubic yard, giving a channel between the piers with a depth of 16 feet at low water, with a channel width of 150 feet. The cost includes all operating expenses and repairs, but nothing for depreciation.

In April, 1911, a survey of the channel was made, when it was found that filling had occurred so that the limiting depth was 15 feet.

Specifications were prepared for the excavation of 160,000 cubic yards, scow measurement, under the project of June 25, 1910, and the work advertised. Bids were opened May 15, 1911.

APPROPRIATIONS.

For previous projects (as listed in H. Doc. 421, 57th Cong., 2d sess.)	$521, 328. 40
Mar. 3, 1899	7, 000. 00
June 6, 1900	3, 048. 37
June 13, 1902	30, 000. 00
Apr. 28, 1904	[1] 23, 000. 00
Mar. 3, 1905	80, 000. 00
Mar. 2, 1907	88, 500. 00
May 24, 1909 (allotment from appropriation of Mar. 3, 1905)	$9, 000. 00
June 25, 1910	71, 680. 00
Sales	53. 56
Feb. 27, 1911	50, 000. 00
	883, 610. 33

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[2] $33,158.49

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	685	1,415	2,100	3,122,627
Sailing	73	125	198	64,216
Total	758	1,540	2,298	3,186,843

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[1] Of this appropriation $1,269.07 was returned to the Treasury.
[2] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Cents.*
Bituminous coal	546,944 long tons	612,577.00	$1,367,360	175	0.4
Plaster boards	361,000 pounds	180.00	2,743	60	.6
Gypsum rock	806,000 pounds	403.00	641	60	.6
Clay and sand	1,432,000 pounds	716.00	8,087	60	.6
Lubricating oil	53,500 gallons	127.38	10,544	150	.2
Mustard	471,000 pounds	236.00	130	150	.2
Photographic goods			48,087	100	
Salt	412,000 pounds	206.00	1,463	150	.2
Celluloid			1,413	100	
Plaster	40,000 pounds	20.00	1,564	60	.6
Iron	1,476 long tons	1,653.00	25,668	60	.6
Bituminous coal to Ogdensburg, etc.	318,853 long tons	357,115.00	892,788	230	.1
Labels			2,740	150	.2
Total		973,233.38	2,363,228		

P P 3.

IMPROVEMENT OF HARBOR AT PULTNEYVILLE, N. Y.

REPORT OF OPERATIONS.

No work was done at this harbor during the fiscal year.

The commerce of Pultneyville is insignificant.

For the reason that there is practically no commerce at Pultneyville Harbor nor any prospect of any in the future I am of the opinion that this harbor is not worthy of further improvement, except for the preservation of existing structures.

APPROPRIATIONS.

July 11, 1870	$5,000
Mar. 3, 1871	5,000
June 10, 1872	10,000
Mar. 3, 1873	10,000
June 23, 1874	10,000
Mar. 3, 1875	10,000
Aug. 14, 1876	3,000
June 18, 1878	5,000
Mar. 3, 1879	4,000
June 14, 1880	3,000
Mar. 3, 1881	$2,000
Aug. 2, 1882	4,000
Sept. 19, 1890	2,000
July 13, 1892	1,000
Aug. 17, 1894	1,500
June 3, 1896	1,500
Mar. 3, 1899	2,000
Mar. 2, 1907	6,000
	85,000

CONTRACTS.

No contracts in force.

P P 4.

IMPROVING HARBOR AT GREAT SODUS BAY, N. Y.

REPORT OF OPERATIONS.

At the beginning of the fiscal year work was in progress upon the project for replacing with concrete the timber superstructure of both east and west piers, the work being done by hired labor and United States plant.

During the fiscal year 421 linear feet of concrete superstructure were built on the east pier and 304 linear feet on the west pier, at an average cost of $31.80 per linear foot, including office and all other expenses, but nothing for depreciation.

A survey made in April, 1911, showed that the channel had deteriorated so that the limiting depth was 10.5 feet, and the excavation of 50,000 cubic yards of sand, etc., was necessary to restore the channel to project width and depth.

June 9, 1911, the United States dredge *Frontenac* began work redredging the channel, and at the end of the fiscal year had removed 6,885 cubic yards, at a cost of 10.5 cents per yard, making available a channel 80 feet wide, with a least depth of 12.5 feet at low water. The cost includes all operating expenses and repairs, but nothing for depreciation.

During the winter one of the material scows was hauled out and rebuilt.

Great Sodus Bay is worthy of improvement necessary to reconstruct the piers and breakwaters in a durable manner and to maintain the channel now provided for.

APPROPRIATIONS.

For previous projects (as listed in H. Doc. No. 421, 57th Cong., 2d sess.)	$475,646.80
Mar. 3, 1899	14,000.00
June 13, 1902	5,000.00
June 13, 1902 (allotment)	1,250.00
Mar. 3, 1905 (allotment)	1,588.00
Mar. 2, 1907	$50,000.00
June 25, 1910	30,000.00
Feb. 27, 1911	30,000.00
Received from other sources	1.00
Sales	3.95
	607,489.75

CONTRACTS IN FORCE.

No contracts in force.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $20,500

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened, April 11, 1910; closed, December 5, 1910.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	20	120	140	18,519
Sailing	43	81	124	27,741
Total	63	201	264	46,260

---

[1] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Cents.*
Coal	1,164 long tons	1,304	$96,628	90	0.888
Do	1,000 long tons	1,120		125	.480
Do	193 long tons	216		100	.850
Do	184 long tons	206		60	1.250
Do	135 long tons	151		65	1.153
Do	134 long tons	150		77	.974
Do	8,184 long tons	9,166		131	.648
Do	6,796 long tons	7,612		70	.571
Do	3,120 long tons	3,494		85	.588
Do	3,084 long tons	3,454		155	.419
Do	1,629 long tons	1,824		125	.280
Do	1,507 long tons	1,688		250	.320
Do	1,195 long tons	1,338		365	.219
Do	831 long tons	931		120	.333
Do	746 long tons	836		242	.330
Do	710 long tons	795		115	.521
Do	583 long tons	653		125	.520
Do	380 long tons	426		75	.600
Do	250 long tons	280		71	.633
Feldspar	1,706 long tons	1,911	7,577	68	.600
Total		37,555	104,205		

P P 5.

IMPROVEMENT OF HARBOR AT LITTLE SODUS BAY, N. Y.

REPORT OF OPERATIONS.

At the beginning of the fiscal year work was in progress upon the project for replacing with concrete the timber superstructure of west pier, the work being done by hired labor and the use of United States plant.

During the fiscal year 540 linear feet of concrete superstructure were placed on the west pier. Four cribs, each 20 feet wide and about 30 feet long, were also built and sunk in the line of the west pier. They replaced the same number of cribs that had been destroyed by wave action. The average cost of completed work was $33.14 per linear foot, including office and all other expenses, except depreciation.

August 1, 1910, the United States dredge *Frontenac* began work redredging the channel between the piers between Little Sodus Bay and Lake Ontario. At the close of the season 17,945 cubic yards of sand, etc., had been removed. The dredge was also employed in digging out the four cribs in west pier, which were replaced as above.

A survey made in April, 1911, showed that the channel had filled so that the limiting depth was 12½ feet at low water, and the excavation of 38,000 cubic yards of sand was necessary to restore the channel to project width and depth.

Dredging was resumed May 8, 1911, and continued until June 8, 1911, when it became necessary to send the dredging plant to Great Sodus Harbor.

Up to the close of work the dredge had removed during May and June, 9,930 cubic yards, scow measurement, making available a channel 80 feet wide, with a least depth of 14 feet at low water. The total number of cubic yards removed during the fiscal year was 27,875, and the average cost per cubic yard was 11 cents, the cost including all operating expenses and repairs, but nothing for depreciation.

During the winter the United States derrick scow *No. 5*, which is at Little Sodus, was repaired.

APPROPRIATIONS.

For previous projects (as listed in H. Doc. No. 421, 57th Cong., 2d sess.)	$338, 441. 77
June 13, 1902	25, 000. 00
June 13, 1902 (allotment)	[1] 2, 000. 00
Mar. 3, 1905	30, 000. 00
Mar. 2, 1907	75, 000. 00
June 25, 1910	$30, 000. 00
Feb. 27, 1911	30, 000. 00
Repayments	21. 00
Sales	1. 70
	530, 464. 47

CONTRACTS IN FORCE.

No contracts in force.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement .... [2] $25, 500

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Opened April 6, 1910; closed, November 28, 1910.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	81	229	310	79,945
Sailing	47	74	121	32,838
Total	128	303	431	112,783

---

[1] Returned to Treasury, $1,179.04.

[2] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Cents.*
Coal	6,368 long tons	7,132	$480,708	120	0.416
Do	2,996 long tons	3,356		85	.823
Do	867 long tons	971		60	1.250
Do	324 long tons	363		72	.833
Do	39,700 long tons	44,464		237	.337
Do	17,342 long tons	19,423		135	.259
Do	7,807 long tons	8,744		110	.555
Do	6,070 long tons	6,798		360	.222
Do	3,641 long tons	4,078		66	.606
Do	3,354 long tons	3,756		140	.464
Do	1,434 long tons	1,606		95	.681
Do	1,325 long tons	1,484		400	.200
Do	1,166 long tons	1,306		100	.500
Do	622 long tons	697		170	.294
Do	885 long tons	991		760	.092
Do	612 long tons	685		125	.680
Do	973 long tons	1,090		120	.541
Do	463 long tons	519		140	.357
Do	418 long tons	468		70	.642
Do	425 long tons	477		110	.500
Do	384 long tons	430		245	.326
Do	382 long tons	428		815	.086
Do	318 long tons	356		....	....
Do	357 long tons	400		300	.266
Do	290 long tons	325		190	.421
Do	202 long tons	226		....	....
Do	120 long tons	134		94	.691
Do	101 long tons	113		75	.800
Do	84 long tons	94		....	....
Lumber	957,000 feet b. m.	1,679	26,575	32	1.875
Apples and pears	475 bushels	14	325	....	....
Total	....	112,607	507,603	....	....

P P 6.

IMPROVEMENT OF HARBOR AT OSWEGO, N. Y.

REPORT OF OPERATIONS.

July 22, 1910, contract was entered into with Ashton W. Adams, Chaumont, N. Y., for furnishing 10,809.21 net tons of riprap stone on scows at the quarry for 70 cents per ton. This stone was purchased for the outer breakwater and to complete the amount due under the annulled contract with John J. Sullivan. An agreement was made with A. R. Hinckley to transport the stone from the quarry at Chaumont to Oswego for 35 cents per ton. Delivery under this contract was completed September 27, 1910. Two hundred and nine tons of riprap were purchased in open market from the Adams & Duford Co., Chaumont, N. Y., and transported by A. R. Hinckley to Oswego, the cost of stone and transportation being the same as under the Adams contract.

October 5, 1910, contract was entered into with the Picton Island Red Granite Co. to furnish at the quarries 75,000 tons of riprap for the outer breakwater, at 65 cents per net ton. Up to the close of the season of 1910, 4,554.37 tons had been delivered. The stone was transported on United States scows towed by the steamer *Wm. E. Chapman* (now *W. H. Lee*), which was purchased at New York for $19,700 and brought to Oswego at a cost of $1,611.15, to be used principally for transporting stone. The cost of delivering stone during 1910 by the *Wm. E. Chapman* was 73 cents per ton. This high cost was due to the failure of the contractor to furnish stone at the desired rate and to the numerous storms and gales occurring during this period.

During the winter the *Wm. E. Chapman* was thoroughly overhauled, modified to burn bituminous coal instead of anthracite, and painted, at a cost of $1,454 for labor and materials.

In April, 1911, the transportation of stone for the Picton Island Red Granite Co. was resumed, and up to the close of the fiscal year 9,555.89 tons had been delivered at Oswego, making a total under this contract of 14,112.26 tons. The cost of transporting stone during the season of 1911 was 31 cents per ton. This cost, although lower than the price (50 cents per ton) offered by the only bidder then available, is still high. This is on account of the failure of the contractor to furnish stone at the stipulated rate.

The floating plant was overhauled and painted during the winter.

A temporary marine railway for hauling out scows was built in the East Cove at a cost of $1,253.84 for labor. Two lake scows were hauled out and calked, and two 6-inch longitudinal bulkheads placed in each scow.

A marine railway was also built at the United States reservation at the shore end of the inner breakwater, to be used for hauling out the United States launch and other small boats.

A stone crusher was purchased at a cost of $1,357.50. The clearing of the reservation at the shore end of the shore arm of the outer breakwater of weeds, shrubs, and sod was begun. The crusher was installed, ramps and runways were constructed from old timber, a temporary storehouse was built, portable track was laid, and about 1,200 cubic yards of the gravel found on the beach of the reservation and cobblestone recovered from spur cribs torn out of the harbor were crushed. The total cost of this work, exclusive of the material in the temporary storehouse, was $2,003.80.

Repairs were begun to the crib in the lake arm of the outer breakwater, near the northwest corner, which was breached in 1909.

Repairs were also begun to the crib at the northerly end of the pier extending out from the main light. This crib also was breached in 1909.

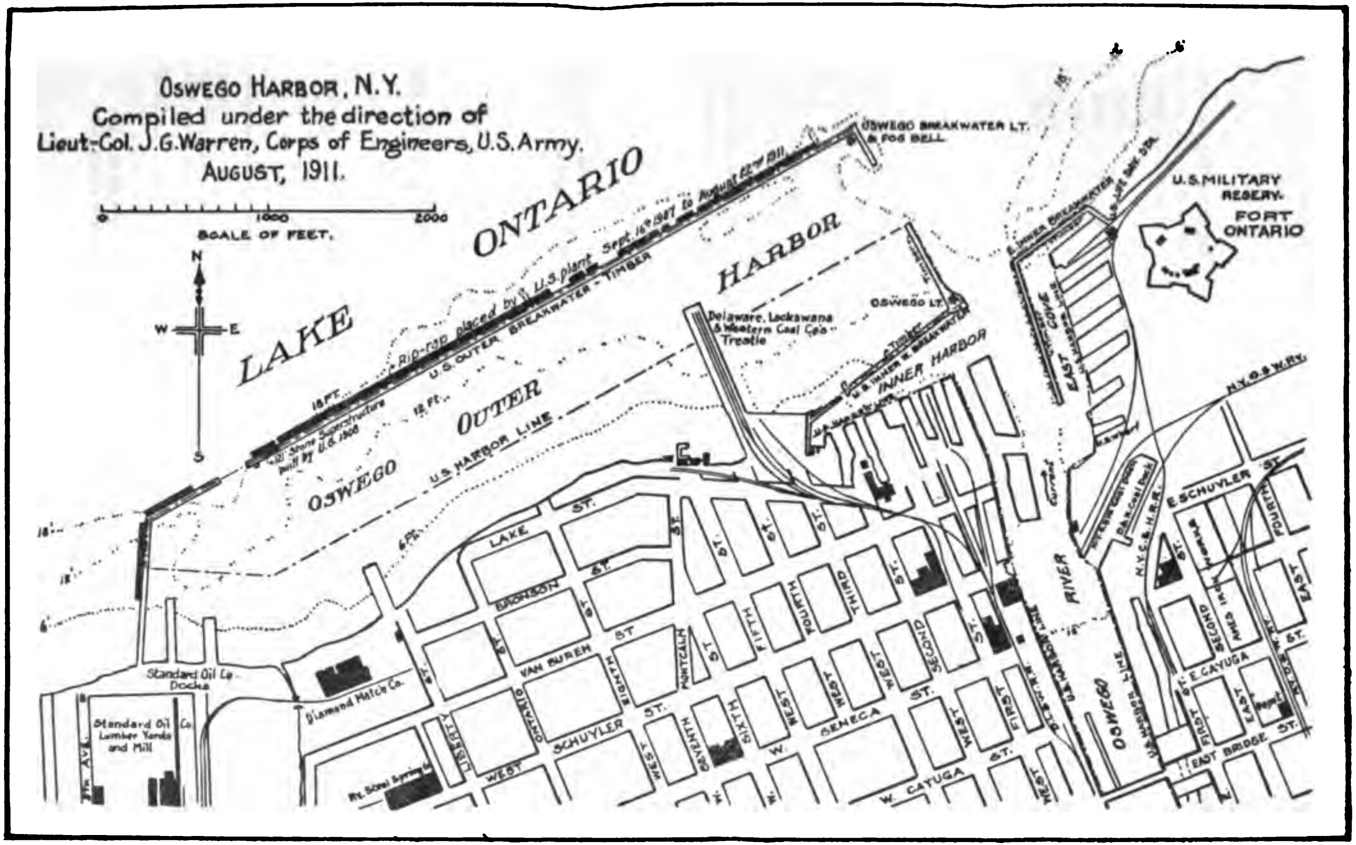
The repair of the inner breakwater was begun and the stone removed from the banquette deck down to water level for a distance of about 200 feet.

A new dredge hull was begun for the U. S. dredge *Frontenac*, the cost of which is divided between Charlotte, Great Sodus, Little Sodus, and Oswego. Contract for furnishing machinery for the hull was made with the Marion Steam Shovel Co.

During December, 1910, the dredge *Frontenac* was engaged in excavating for the temporary marine railway in the East Cove. Upon the completion of this work the dredge was laid up for the season and the dipper and dipper handle taken down for repairs.

The cost of dredging for the marine railway is included in the cost of that work, and the cost of laying up and dismantling was $344.36.

During the winter minor repairs were made to the dipper and machinery.



OSWEGO HARBOR, N.Y.
Compiled under the direction of
Lieut.-Col. J.G. Warren, Corps of Engineers, U.S. Army.
AUGUST, 1911.

April 1, 1911, the dredge began to fit out and during the month was engaged in removing two counterforts from along the inner face of the outer breakwater. The cost of this work was $606.

APPROPRIATIONS.

For previous projects (as listed in H. Doc. 421, 57th Cong., 2d sess.)	[1] $1,842,612.87
June 3, 1896	60,000.00
Mar. 3, 1899	60,000.00
Mar. 22, 1901 (allotment)	10,000.00
June 13, 1902	51,000.00
Mar. 3, 1905	100,000.00
Mar. 2, 1907	100,000.00
Mar. 4, 1909	$100,000.00
Mar. 3, 1909 (allotted Apr. 9, 1909)	40,000.00
June 25, 1910	125,000.00
Feb. 27, 1911	85,000.00
Sales	3,476.77
	2,577,089.64

CONTRACTS IN FORCE.

For furnishing and delivering on board boats at Picton Island, St. Lawrence River, N. Y., 75,000 tons, more or less, of riprap stone:

Name of contractor: The Picton Island Red Granite Co., 320 Fifth Avenue, New York City.

Rate: 65 cents per ton.

Date of contract: October 5, 1910.

Date of approval: October 21, 1910.

Date of commencement: October 18, 1910.

Total amount: $48,750.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[2] $103,000

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened March 19, 1910; closed December 20, 1910.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	618	500	1,118	521,750
Sailing	226	582	808	230,798
Total	844	1,082	1,926	752,548

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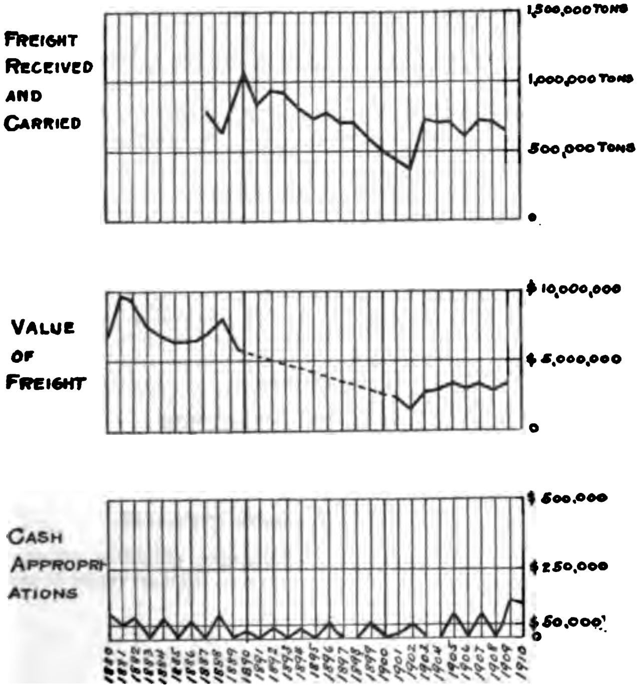
[1] $36,000 allotted and transferred not shown in H. Doc. No. 421, 57th Cong., 2d sess.

[2] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Cents.*
Coal	109,618 long tons	122.772	$2,912,866	1,039	0.067
Do	51,999 long tons	58,239		954	.073
Do	11,572 long tons	12.961		110	.454
Do	3,412 long tons	3,821		62	1.048
Do	2,840 long tons	3,181		660	.106
Do	12,149 long tons	13,607		848	.082
Do	3,984 long tons	4,462		900	.077
Do	1,988 long tons	2,227		1,149	.060
Do	5,005 long tons	5,606		75	1.000
Do	623 long tons	698		38	1.447
Do	299 long tons	335		45	1.444
Do	293 long tons	328		650	.107
Do	166 long tons	186		70	1.070
Do	75 long tons	84		50	1.300
Do	39 long tons	44		62	1.048
Do	159,348 long tons	178,470		227	.352
Do	68,385 long tons	76.591		144	.243
Do	33,425 long tons	37,436		56	.715
Do	12,480 long tons	13.978		95	.431
Do	15.175 long tons	16,996		100	.600
Do	9,443 long tons	10,577		70	.714
Do	6,891 long tons	7.718		100	.400
Do	7,904 long tons	8,853		60	.750
Do	3,600 long tons	4.032		125	.368
Do	2,649 long tons	2,967		110	.590
Do	2,090 long tons	2,341		137	.328
Do	4,059 long tons	4,546		102	.539
Do	1,868 long tons	2,093		150	.666
Do	1,600 long tons	1,792		122	.737
Do	1,143 long tons	1,280		130	.269
Do	1,575 long tons	1.763		120	.750
Do	1,941 long tons	2,174		116	.732
Do	918 long tons	1,029		105	.380
Do	5,411 long tons	6,061		87	.689
Do	1,080 long tons	1,210		50	.900
Do	787 long tons	882		56	.891
Do	617 long tons	692		90	.555
Do	347 long tons	389		141	.637
Do	264 long tons	296		65	.769
Do	212 long tons	238		56	.803
Do	383 long tons	429		65	.923
Do	178 long tons	200		50	.900
Do	186 long tons	208		95	.526
Do	2,090 long tons	2,341		80	.563
Do	1,128 long tons	1,264		120	.375
Do	5,876 long tons	6,581		1,022	.058
Do	6,326 long tons	7,085		1,022	.058
Do	602 long tons	674		175	.428
Do	1,788 long tons	2,003		350	.228
Do	391 long tons	438		54	.740
Do	385 long tons	432		....	....
Do	2,389 long tons	2,676		130	.500
Do	3,324 long tons	3,723		660	.106
Do	790 long tons	885		162	.308
Do	487 long tons	545		165	.303
Do	212 long tons	237		100	.600
Do	355 long tons	398		56	.803
Do	99 long tons	111		65	.769
Do	44 long tons	49		261	.210
Pulp wood	24,736 cords	49,472	168,239	533	.225
Lumber	18,342,000 feet b. m.	32,179	374,321	224	.390
Laths	2,942,000 pieces	736	4.200	80	1.000
Shingles	5,815,000 pieces	969	10,928	100	1.800
Railroad ties	10,646 pieces	800	3,696	100	1.280
Wood pulp	475 long tons	532	8.066	....	....
Corn	143,000 bushels	3,972	71,500	1,041	.070
Barley	160,000 bushels	3,840	128,000	1,149	.145
Hay	50 long tons	56	500	....	....
Household effects	....	....	790	....	....
Stone	15,573 short tons	15,573	16,040	55	.830
Total	....	751,363	3,609,146	....	....

OSWEGO HARBOR, N.Y.



P P 7.

IMPROVING HARBOR AT CAPE VINCENT, N. Y.

REPORT OF OPERATIONS.

October 9, 1910, the excavation of trench for the foundation of the proposed 220 feet extension of breakwater was begun, and continued until November 22, 1910. United States plant and hired labor were used.

There were removed 1,523 cubic yards of mud, clay, and sand, at an average cost of 86 cents per cubic yard.

The filling of trench with stone was begun immediately after the excavation was finished. Six hundred and ninety-eight tons of stone were placed before the suspension of work for the season of 1910. One hundred and ninety-nine and thirty-six one-hundredths tons of stone were also placed in the trench during May, 1911, at an average cost per ton of $1.15.

Specifications for the extension to the breakwater have been prepared and approved.

A watchman was on duty during the year to regulate the mooring of vessels to the breakwater.

APPROPRIATIONS.

June 3, 1896	$25,000
Mar. 3, 1899	25,000
June 13, 1902	48,000
Mar. 3, 1905	30,000
June 25, 1910	36,000
	164,000

CONTRACTS IN FORCE.

No contracts in force.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $36,000

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened, March 26; closed, December 24.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	146	725	871	260,865
Sailing	64	28	92	18,883
Total	210	753	963	279,748

No record of passengers kept.

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[1] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	
Fresh fish	1,242,422 pounds	622.00	$69,171	22	$0.09
Cattle	261 head	65.25	1,899	22	.09
Horses	15 head	9.00	2,195	22	.076
Machinery		40.00	32,580	22	.09
Automobile	2	2.20	2,984	22	.21
Mica	56,068	28.00	17,064	22	.09
Peas	9,369 bushels	288.90	8,952	22	.075
Hay		940.00	8,905	12	.083
Pulp wood	8,934 cords	17,868.00	75,605	490	.002
Wood pulp		2,817.00	60,904	400	.007
Shingles	2,279 M.	379.83	5,784	22	.04
Boots and shoes	1,496 pairs		3,547	22	.09
Lumber	1,511,500 feet b. m.	2,651.75	32,777	60	.009
Household goods		15.00	11,148	22	.09
Oysters	4,700 gallons	18.80	2,941	22	.09
Paper hangings		5.00	3,457	22	.09
Fence posts	23,940	598.50	1,197	22	.09
Sundries		7,000.00	147,183	22	.09
Total		33,344.23	488,248		

P P 8.

IMPROVEMENT OF OGDENSBURG HARBOR, N. Y.

REPORT OF OPERATIONS.

A survey was made of all the channels in the harbor during May, 1911.

Specifications for dredging the channels were prepared, the work advertised, and bids opened May 15, 1911.

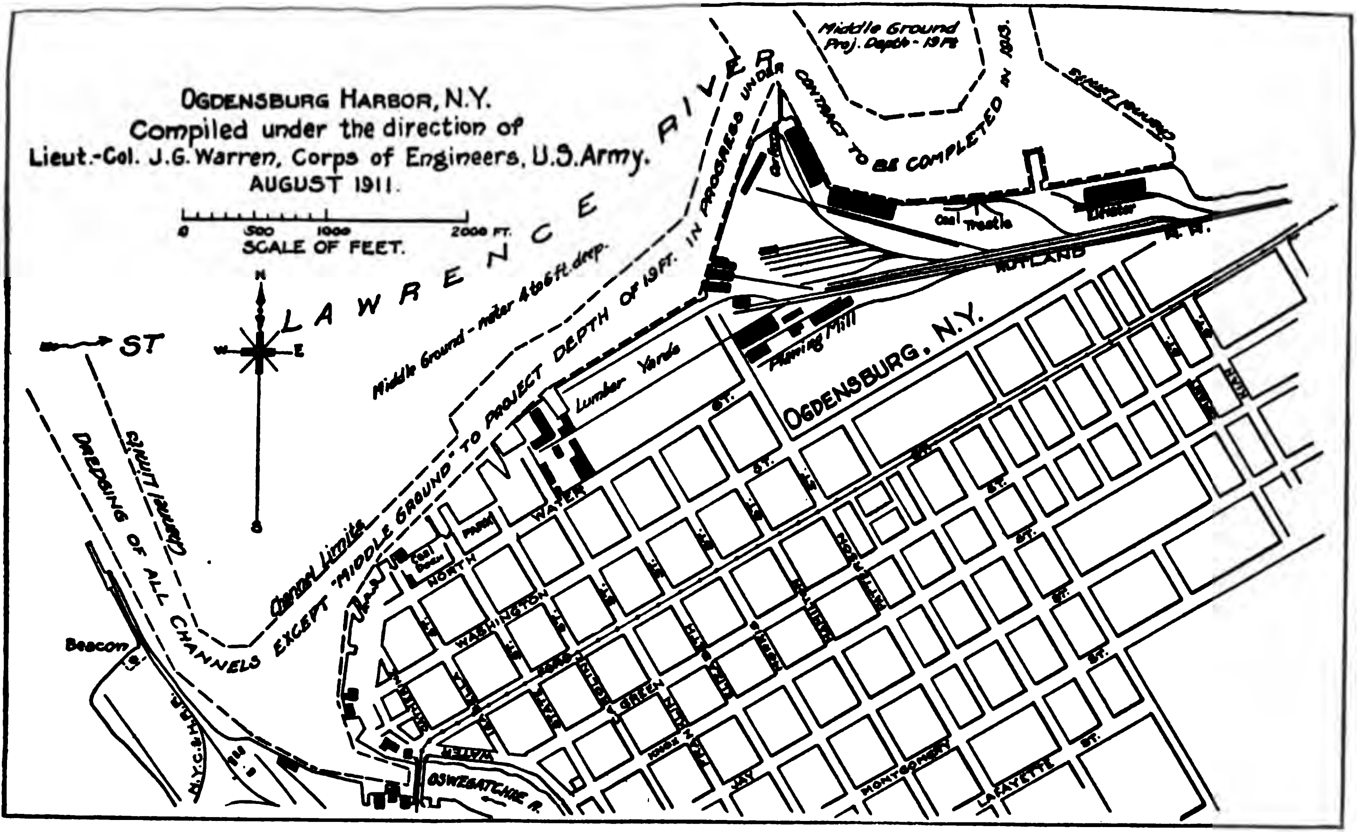
Work under contract to be made with the Duluth Marine Contracting Co. will commence at the beginning of the next fiscal year.

APPROPRIATIONS.

For previous projects (as listed in H. Doc. 421, 57th Cong., 2d sess.)	$282,000.00
Mar. 3, 1899	15,000.00
June 13, 1902	20,000.00
Mar. 13, 1903	15,000.00
Mar. 3, 1905 (allotment)	9,938.29
Mar. 2, 1907	75,000.00
June 25, 1910	100,000.00
	516,938.29

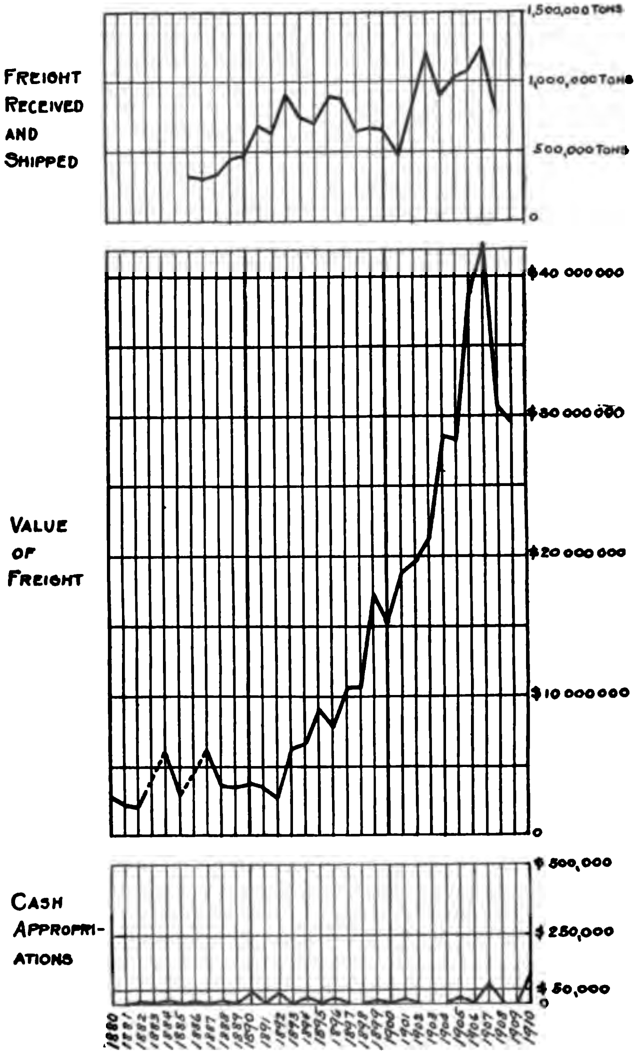
CONTRACTS IN FORCE.

No contracts in force.



OGDENSBURG HARBOR, N.Y.
Compiled under the direction of
Lieut.-Col. J. G. Warren, Corps of Engineers, U.S. Army.
AUGUST 1911.

OGDENSBURG HARBOR, N.Y.



COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened, April 1, 1910; closed, December 14, 1910.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Documented:					
Steamers	2,110	551	2,661	1,166,940	[1] 100,000
Sailing	169	31	200	82,987	....
Total	2,279	582	2,861	1,249,927	....

[1] Estimated.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	
Raw silk	4,281,122 pounds	2,140	$12,572,673		$0.228
Nickel matte	25.517 long tons	28,579	4,041,745		.17
Wood pulp	39,331,218 pounds	24,665	414,359		.17
Lumber	90,130,590 feet b. m	158,124	....		.17
Do	2,373,512 feet b. m	4,164	2,182,630	1,080	.001
Do	4,521,386 feet b. m	7,932	....	150	.0002
Shingles	17,471,940 pieces	2,012	47,177		.17
Lath	28,038,525 pieces	7,010	79,400		.17
Fish	1,804,564 pounds	902	82,793		.17
Copper bars	1,875,723 pounds	937	247,016		.17
Hay	3,891 long tons	4,358	37,870		.17
Miscellaneous imports	....	....	2,512,312		....
Flour and feed	8,302 short tons	8,302	....	1,150	....
Do	24.006 short tons	24,906	....	1,120	....
Grain	4,718,727 bushels	132,529	....	1,150	.0009
Coal	317,000 short tons	317,000	....	180	.003
Do	1.120 short tons	1,120	....	120	.006
Do	2,985 short tons	2,985	....	350	.002
Do	7,000 short tons	7,000	....	125	.0048
Do	9,374 short tons	9,374	....	110	.0054
Miscellaneous	2,707 short tons	2,707	....	1,150	....
Do	2,646 short tons	2,646	....	1,120	....
Lumber	4,970,514 feet b. m	8,720	....	825	.0019
Do	202,459 feet b. m	355	....	780	.002
Do	821,162 feet b. m	1,441	....	1,250	.0014
Coal	109,569 short tons	109,569	354,403		.17
Miscellaneous	50,000 short tons	50,000	3,058,160		.17
Exports west bound	55,878 short tons	55,878	....	1,150	....
Do	18,626 short tons	18,626	....	1,120	....
Miscellaneous	....	....	241,786		....
Bonded I. T—					
Bonded T. and E.	....	....	371,022		....
Bonded under consular seal	9,435 net tons	9,435	4,573,508	....	....
Total	....	1,004,317	30,816,854	....	....

APPENDIX Q Q.

IMPROVEMENT OF RIVERS AND HARBORS IN THE LOS ANGELES, CAL., DISTRICT.

REPORT OF CAPT. CHAS. T. LEEDS, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. San Diego Harbor, Cal.
2. Los Angeles Harbor, Cal.
3. San Luis Obispo Harbor, Cal.

United States Engineer Office,
Los Angeles, Cal., July 15, 1911.

Sir: I have the honor to forward herewith annual report on works of river and harbor improvement in my charge for the fiscal year ending June 30, 1911.

Very respectfully, your obedient servant,

Chas. T. Leeds,
Captain, Corps of Engineers.

The Chief of Engineers, United States Army.

Q Q 1.

IMPROVEMENT OF SAN DIEGO HARBOR, CAL.

With the appropriation of $125,000 made by river and harbor act of June 25, 1910, 88,593 cubic yards of material at $0.1489 per yard was dredged in the channel through the outer bar and middle ground under contract with the Standard American Dredging Co., dated October 24, 1910. Of this amount, 40,934 cubic yards was dredged from the westerly side of the channel through the outer bar and 47,659 cubic yards was dredged from the center of the channel through the middle ground. This work was done with the hopper dredge *South Bay*, which is a converted steam schooner with 18-inch centrifugal pump. Work began May 31, 1911, and was in progress at the close of the fiscal year.

APPROPRIATIONS.

Total prior to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$432,500.00
Mar. 3, 1903	192,850.00
Mar. 3, 1905	10,000.00
Mar. 2, 1907	20,000.00
Mar. 3, 1909	30,000.00
June 25, 1910	125,000.00
Repayment	3.26
Total	810,353.26

CONTRACT IN FORCE.

Name of contractor: Standard American Dredging Co., San Francisco, Cal.
Amount and character of work: Dredging, $120,000.
Price per unit: $0.1489 per cubic yard, scow measurement.
Date of approval: November 8, 1910.
Date of beginning work: May 1, 1911.
Date of expiration: September 19, 1912.

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Open entire year.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Registered:					
Steamers	633	12	645	726,939	[1] 3,609
Sailing	55	4	59	27,210	
Unregistered, rafts	3		3		
Total	691	16	707	754,149	3,609

[1] Passengers to and from foreign ports.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Estimated valuation.
Lumber	80,066,000 feet b. m.	140,115	$1,761,452
Crude oil	466,888 barrels	88,419	350,166
Cement	15,234 barrels	3,047	30,468
Wool	34,000 pounds	17	6,800
Salt		392	10,192
Ores		2,714	542,800
Manufactured iron and steel		1,811	362,200
Brick	618,160 pieces	1,545	4,950
Grain		445	13,350
Fertilizer		1,694	42,484
Coal and coke		38,954	154,057
Live stock	11,043 head	3,036	147,984
Pig iron		2,961	44,665
Onyx		16,510	119,430
Sulphate of potash		1,774	66,209
General merchandise		94,674	18,934,800
Total		398,048	22,591,487

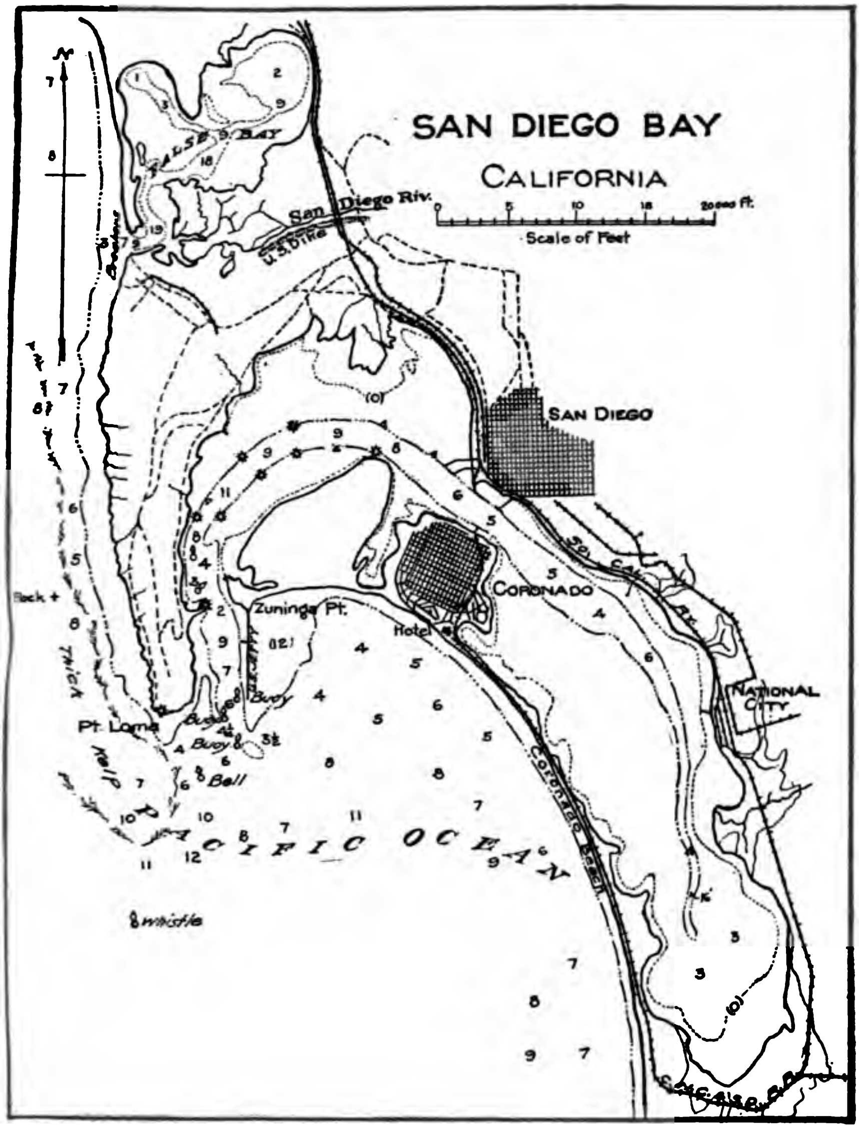
Q Q 2.

IMPROVING LOS ANGELES HARBOR, CAL.

(A) THE OUTER HARBOR.

The construction of the breakwater, which was practically completed at the beginning of the fiscal year, was completed September 9, 1910, under continuing contract dated June 7, 1900, with the California Construction Co. During the fiscal year 26 long tons of granite was placed in the substructure at a cost of $0.844 per ton; 3,370 long tons of granite was placed in the superstructure at a cost of $3.10 per ton, and 80 long tons of granite was placed as a berm at the toe of the ocean slope of the superstructure at a cost of $2 per ton.

Under appropriation of $178,000 made by river and harbor act of June 25, 1910, work was begun on the extension of the breakwater to


SAN DIEGO BAY
CALIFORNIA
Scale of Feet
0
5
10
15
20000 Ft.
N
FALSE BAY
San Diego Riv.
U.S. Dike
SAN DIEGO
CORONADO
Hotel
Zuninga Pt.
NATIONAL CITY
Pt. Loma
Rock +
Buoy
Bell
Whistle
PACIFIC OCEAN
Coronado Beach
So. Cal. Ry.
(0)

2544

the shore under contract with W. S. Russell, dated January 4, 1911. Work under this contract began April 21, 1911, and up to the close of the fiscal year 15,155 long tons of stone had been delivered and placed in the breakwater at a cost of $1.38 per ton. This breakwater extension has been built up to low water for a distance of 355 feet, but not to full cross section. Some stone has been placed over a farther distance of 353 feet. The stone used is granite and is obtained from the Declez Quarry near Riverside, Cal.

(B) THE INNER HARBOR.

On June 30, 1911, the Chief of Engineers authorized increasing from $420,000 to $596,000 the estimated cost of dredging the inner harbor to 30-foot depth from the outer harbor up to and including the turning basin. The original estimate is printed in House Document No. 1114, Sixtieth Congress, second session, and contemplated the dredging of 3,000,000 cubic yards of material at 14 cents per yard. Of this amount 800,000 cubic yards was estimated to be in the entrance channel southerly of the northerly end of Deadmans Island. The material to be dredged from this section was found to be mostly very hard clay with occasional nests of bowlders, and opposite Deadmans Island shale and soft rock in ledge. The outer end of this section is somewhat exposed. As it was impracticable to do this work with a suction dredge it was necessary to have it done under contract. Estimating, therefore, 800,000 cubic yards at 47 cents per yard to be done by contract at a total cost of $376,000, and 2,200,000 cubic yards at 10 cents per yard to be done with the United States dredge at a total cost of $220,000, the total estimated cost for this work is $596,000.

Dredging entrance channel to 30 feet depth under contract.—Under appropriation of $200,000 made by river and harbor act of June 25, 1910, dredging to 30-foot depth was done between dredging stations Nos. 25 + 50 and 56 in the westerly half of the entrance channel of the inner harbor under contract entered into December 8, 1910, with the Standard American Dredging Co. of San Francisco, Cal. This contract calls for the dredging of 333,333 cubic yards at 42 cents per yard. Work under this contract was begun January 19, 1911, and up to the close of the fiscal year 162,736 cubic yards of material had been dredged with the clamshell dredge *San Francisco*. This material was dumped at sea, with the exception of small amounts which were dumped on the Government reservation just east of Deadmans Island and to the west of the west jetty. With the work done the ruling depth of the entrance channel was increased from 20 to 22 feet at mean lower low water and a depth of 22 to 30 feet obtained between stations Nos. 25 + 50 and 56.

Under appropriation of $270,000 made by river and harbor act approved February 27, 1911, proposals were invited for dredging to 30-foot depth the easterly half of the entrance channel, the amount being estimated at 350,000 cubic yards. These proposals were opened June 28, 1911, and an abstract of same forwarded to the Department with recommendation that the bid of the Standard American Dredging Co. of $0.415 per yard be accepted.

Dredging with Government dredge.—The U. S. dredge *San Pedro* was employed during the year in dredging to 31-foot depth the channel from the upper end of Deadmans Island to the lower end of the wharves, and for full width between wharves, over a distance of 1,180 feet. A total of 764,250 cubic yards of material consisting of rotten sandstone, broken shell, yellow and blue clay, sand, cobbles, and quicksand was dredged, pumped 542 to 2,264 feet and wasted as follows: 70,728 cubic yards west of the west jetty, 256,455 cubic yards on the United States reservation east of the east jetty, and 437,067 cubic yards on the concession of the Pacific Wharf & Storage Co. The dredging was done at a total cost of $69,673.20, or $0.091 per cubic yard, including superintendence and office expenses. The repair work done to the dredge during the year is estimated to more than equal its deterioration for that time, so that the dredge is at present in better condition than a year ago.

Considering the actual pumping time for the entire year, the solids amounted to about 4.1 per cent of the total flow through the discharge pipe.

Miscellaneous work.—No dredging was done during October and November. During this time every part of the dredge machinery and the floating plant was thoroughly overhauled by the engine room and deck crews, the only extra labor employed being one boiler maker and two ship carpenters. The ladder of the dredge was lengthened to permit of dredging to increased depth and the dredge frame reinforced with additional hog chains at a total cost of $2,859.37.

Dredging laterals to 20-foot depth.—Under appropriation of $200,000 made by river and harbor act of June 25, 1910, a contract was entered into October 15, 1910, with the Tacoma Dredging Co., of Tacoma, Wash., for dredging channels 20 feet deep and 200 feet wide from the turning basin into the east and west basins, respectively. Dredging began in the east basin January 10, 1911, and up to the close of the fiscal year 616,735 cubic yards had been dredged with the 20-inch suction dredge *Oakland* at a cost of $0.089725 per yard. This material was deposited behind a bulkhead on the northerly side of the channel and on the land of the San Pedro, Los Angeles & Salt Lake Railroad Co. on the southerly side of the east basin. Dredging has been done over a distance of 6,100 feet of channel to the full project width but not to full project depth.

In March, 1911, unusual floods in the San Gabriel and Los Angeles Rivers caused the former to break into the latter, with the result that the Los Angeles River, which normally flows into Long Beach Harbor, deposited a considerable amount of silt in the harbors of Los Angeles and Long Beach. A shoaling, diminishing from about 3 feet at the northeast corner of the east basin to nothing at about Fifth Street, San Pedro, resulted. The material deposited over the area involved will be removed under the existing project which provides for dredging to increased depth. No estimate of the cost of preventing a recurrence of such deposit is given, since an adequate project for flood control of these rivers would involve an extensive survey, for which no funds are considered available at present.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement .... [1] $85,000

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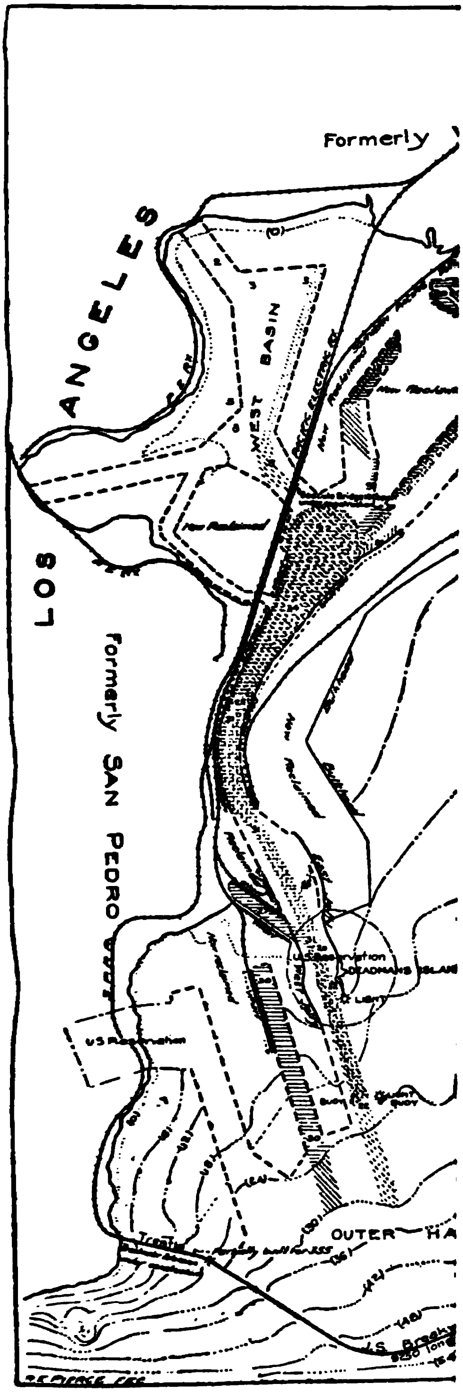
[1] Exclusive of the balance unexpended July 1, 1911.


Formerly
LOS ANGELES
Formerly SAN PEDRO
WEST BASIN
PACIFIC ELECTRIC R.R.
New Reclaimed
U.S. Reservation
DEADMANS ISLAND
LIGHT
BUOY
U.S. Reservation
OUTER HA
Trestle
U.S. Breakw
8250 lon
D.E. PIERCE ENG.

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APPROPRIATIONS.

FOR OUTER HARBOR.

Total prior to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$1,107,085.00
Mar. 3, 1903	500,000.00
Apr. 28, 1904	350,000.00
Mar. 3, 1905	460,000.00
June 30, 1906	290,000.00
Mar. 4, 1907	92,915.00
Mar. 4, 1909	100,000.00
June 25, 1910	178,000.00
Total	3,078,000.00
Receipts from sales	.05
Aggregate	3,078,000.05

FOR INNER HARBOR.

Total prior to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$1,255,000.00
Mar. 3, 1905	100,000.00
June 30, 1906	100,000.00
Mar. 2, 1907	113,000.00
Mar. 4, 1907	50,000.00
Mar. 3, 1909	20,000.00
June 25, 1910	400,000.00
Feb. 27, 1911	270,000.00
Total	2,308,000.00
Receipts from sales and for injuries to dredge	132.50
Aggregate	2,308,132.50

CONTRACTS IN FORCE.

FOR OUTER HARBOR.

CONTRACT FOR CONSTRUCTION OF BREAKWATER.

Name o fcontractor: California Construction Co.
Amount and character of work: Breakwater construction, approximately $2,648,046.
Price per unit: Substructure stone, $0.844 per long ton; superstructure stone, $3.10 per long ton; concrete, $6 per cubic yard.
Date of approval: June 27, 1900.
Date of beginning work: August 4, 1900.
Date of expiration: March 1, 1907; extended for reasonable period.
Completed September 9, 1910.

Name of contractor: California Construction Co.
Date of approval: June 11, 1910.
Provides for the extension of the stone superstructure to the westerly end of the breakwater in lieu of the construction of concrete block.
Supplemental to contract approved June 27, 1900.

CONTRACT FOR CONSTRUCTION OF BREAKWATER EXTENSION.

Name of contractor: W. S. Russell, Los Angeles, Cal.
Amount and character of work: Breakwater construction, $230,000.
Price per unit: $1.38 per long ton.
Date of approval: January 16, 1911.
Date of beginning work: April 24, 1911.
Date of expiration: April 18, 1913.

FOR INNER HARBOR.

CONTRACT FOR FURNISHING CRUDE OIL.

Name of contractor: H. S. Botsford, Los Angeles, Cal.
Amount and character of work: Delivery of 20,000 barrels of fuel oil for dredge.
Price per unit: $1 per barrel.
Date of approval: July 15, 1910.
Date of beginning work: July 1, 1910.
Date of expiration: December 22, 1912.

DREDGING TWO 20-FOOT LATERAL CHANNELS.

Name of contractor: Tacoma Dredging Co., Tacoma, Wash.
Amount and character of work: Dredging, $184,000.
Price per unit: $0.089725 per cubic yard.
Date of approval: November 15, 1910.
Date of beginning work: January 10, 1911.
Date of expiration: November 16, 1913.

DREDGING 30-FOOT CHANNEL.

Name of contractor: Standard American Dredging Co., San Francisco, Cal.
Amount and character of work: Dredging, $140,000.
Price per unit: $0.42 per cubic yard.
Date of approval: December 23, 1910.
Date of beginning work: February 28, 1911.
Date of expiration: February 4, 1912.

COMMERCIAL STATISTICS.

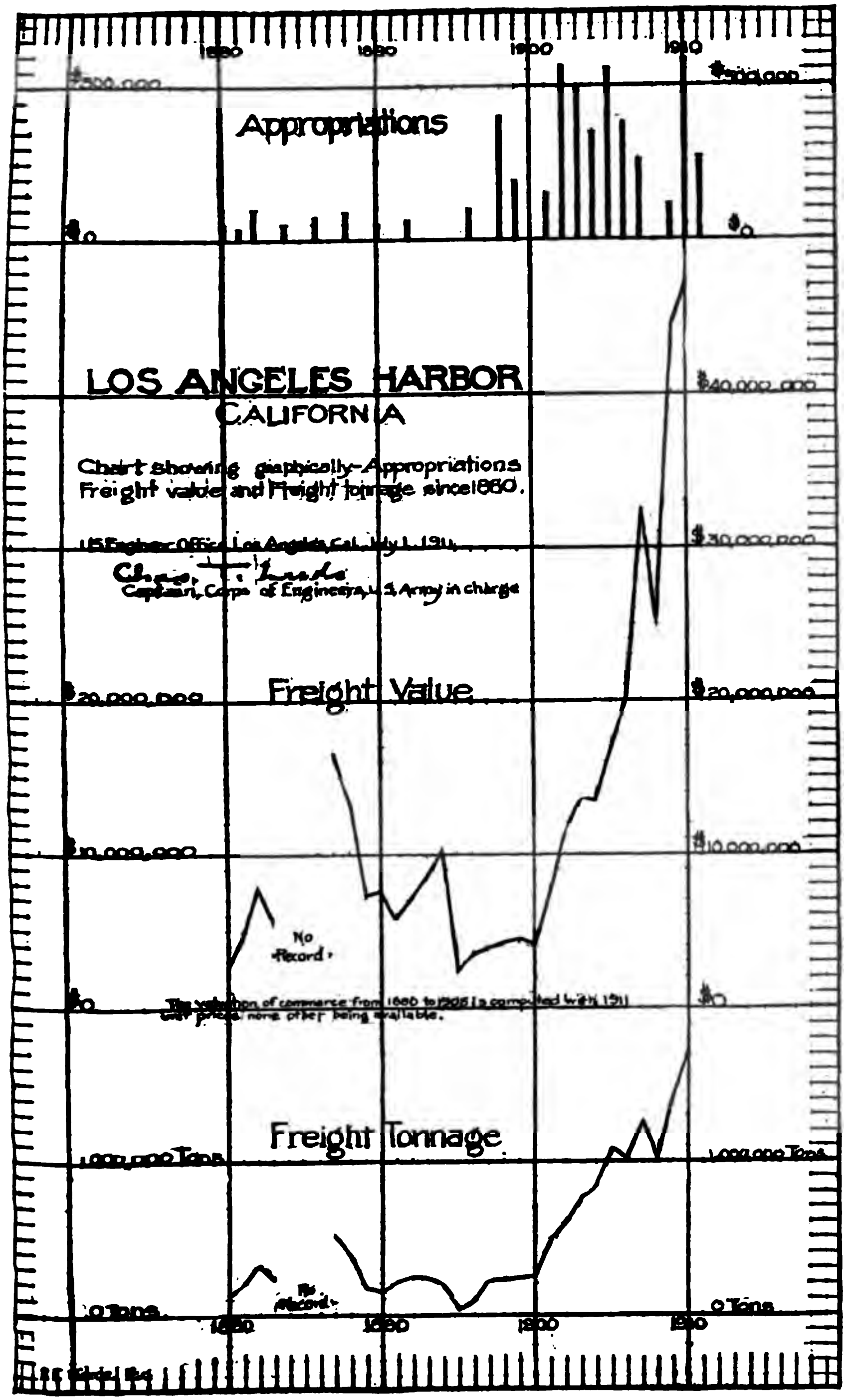
Season of navigation.—Year 1910: Open entire year.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Registered:					
Steamers	2,208	25	2,233	1,530,126	268,086
Sailing	214	3	217	124,937	
Total	2,422	28	2,450	1,655,063	268,086

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Estimated valuation.
Lumber	579,842,876 feet b. m.	1,014,724	$12,756,543
Shingles	243,595,000 pieces	48,719	487,190
Shakes	4,204,000 pieces	2,803	60,958
Lath	70,460,000 pieces	19,572	147,966
Ties	696,308 pieces	44,563	445,640
Piles	18,317 pieces	17,584	366,340
Poles	43,526 pieces	36,561	652,890
Posts	79,565 pieces	2,387	59,673
Logs	7,940 pieces	5,558	55,580
Doors	10,578	529	21,156
Staves		525	15,750
Lumber trucks	182	75	4,550
Grain		30,700	921,000
Flour		3,523	176,150
Sugar		2,028	202,800
Paper		4,600	391,000
Asphalt		9,587	67,109
Coal and coke		6,976	71,390
Cement	225,350 barrels	45,070	450,070
Pig iron		3,454	51,810
Oils	1,301,302 barrels	259,467	2,138,571


LOS ANGELES HARBOR
CALIFORNIA
Chart showing graphically–Appropriations Freight value and Freight tonnage since 1880.
U.S. Engineer Office, Los Angeles, Cal. July 1, 1914.
Chas. T. Leeds
Captain, Corps of Engineers, U.S. Army in charge
Appropriations
$500,000
$500,000
$0
$0
Freight Value
$40,000,000
$30,000,000
$20,000,000
$20,000,000
$10,000,000
$10,000,000
$0
$0
No Record
The valuation of commerce from 1880 to 1906 is computed with 1911 unit prices, none other being available.
Freight Tonnage
1,000,000 Tons
1,000,000 Tons
0 Tons
0 Tons
No Record
1880
1890
1900
1910

Freight traffic—Continued

Articles.	Amount (customary units).	Amount in short tons.	Estimated valuation.
Wool	311 bales	77	$23,100
Plaster	79,600 bags	3,748	37,480
Salt	741 bags	78	2,028
Rice	6,170 bags	308	20,533
Brick	377,000 pieces	942	3,328
Chemicals, drugs, etc		488	97,600
Manufactured iron and steel		5,964	1,192,800
Fruits and nuts		1,399	279,800
Canned goods	9,560 cases	289	26,680
Fertilizers		5,010	143,886
Hay and feed		159	2,385
Scrap metals		1,702	34,040
Wines and liquors		424	84,800
Live stock	11,211 head	3,080	218,792
General merchandise		126,671	25,334,200
Total		1,709,294	47,040,588

Q Q 3.

IMPROVEMENT OF SAN LUIS OBISPO HARBOR, CAL.

At the beginning of the fiscal year the San Francisco Bridge Co., which has the contract for the completion of the breakwater, was engaged in closing the channel at the entrance to Morro Bay on the north side of Morro Rock quarry in order to scour the south channel to sufficient depth to permit of lighters reaching the quarry. A trestle was built across the north channel 1,571 feet in length, from which 10,825 cubic yards of broken stone was dumped into the channel. This work was completed August 7, 1910. Beginning at a point about 265 feet from Morro Rock, a 200-foot channel with no stone above 8 feet below mean lower low water was left in the barrier. This opening, however, has partially filled with sand. The south channel, which had become almost entirely closed, has gradually deepened until there is at present a depth of 15 to 20 feet at mean lower low water along the front of the quarry, and 11 feet on the bar at the entrance.

The delivery of stone in the breakwater was resumed August 23, 1910, and up to November 30 of the same year 9,880 tons had been delivered. Work was then suspended during the winter months. Delivery of stone was resumed on May 11, 1911, and up to the close of the fiscal year 6,957 tons had been delivered in the breakwater, a total of 16,837 tons for the fiscal year. This stone has been placed in the breakwater from station 11+50 to station 17+20. The breakwater is in the following condition: The portion between Point San Luis and Whaler Island and from station 0 (easterly end of Whaler Island) to station 6+70 is completed to full height. From station 6+70 to station 11+80 it is built to a height of from 3 to 5 feet above mean lower low water. Some stone has been placed as far out as station 17+50, which is within 50 feet of the project end of the breakwater.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $46,000

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[1] Exclusive of the balance unexpended July 1, 1911.

APPROPRIATIONS.

Total prior to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$280,000.00
Mar. 3, 1905	25,000.00
Mar. 2, 1907	63,660.00
May 27, 1908	60,000.00
Mar. 4, 1909	30,000.00
Mar. 4, 1911	64,000.00
Total	522,660.00
Receipts from sales	.95
Aggregate	552,660.95

CONTRACT IN FORCE.

Name of contractor: San Francisco Bridge Co., San Francisco, Cal.
Amount and character of work: Breakwater construction, about $237,294.
Price per unit: $1.57 per short ton of stone delivered and placed in the work.
Date of approval: August 15, 1907.
Date of beginning work: May 1, 1908.
Date of expiration: July 20, 1911; waived for a reasonable period.

COMMERCIAL STATISTICS.

[Furnished by the Pacific Coast Ry. Co.]

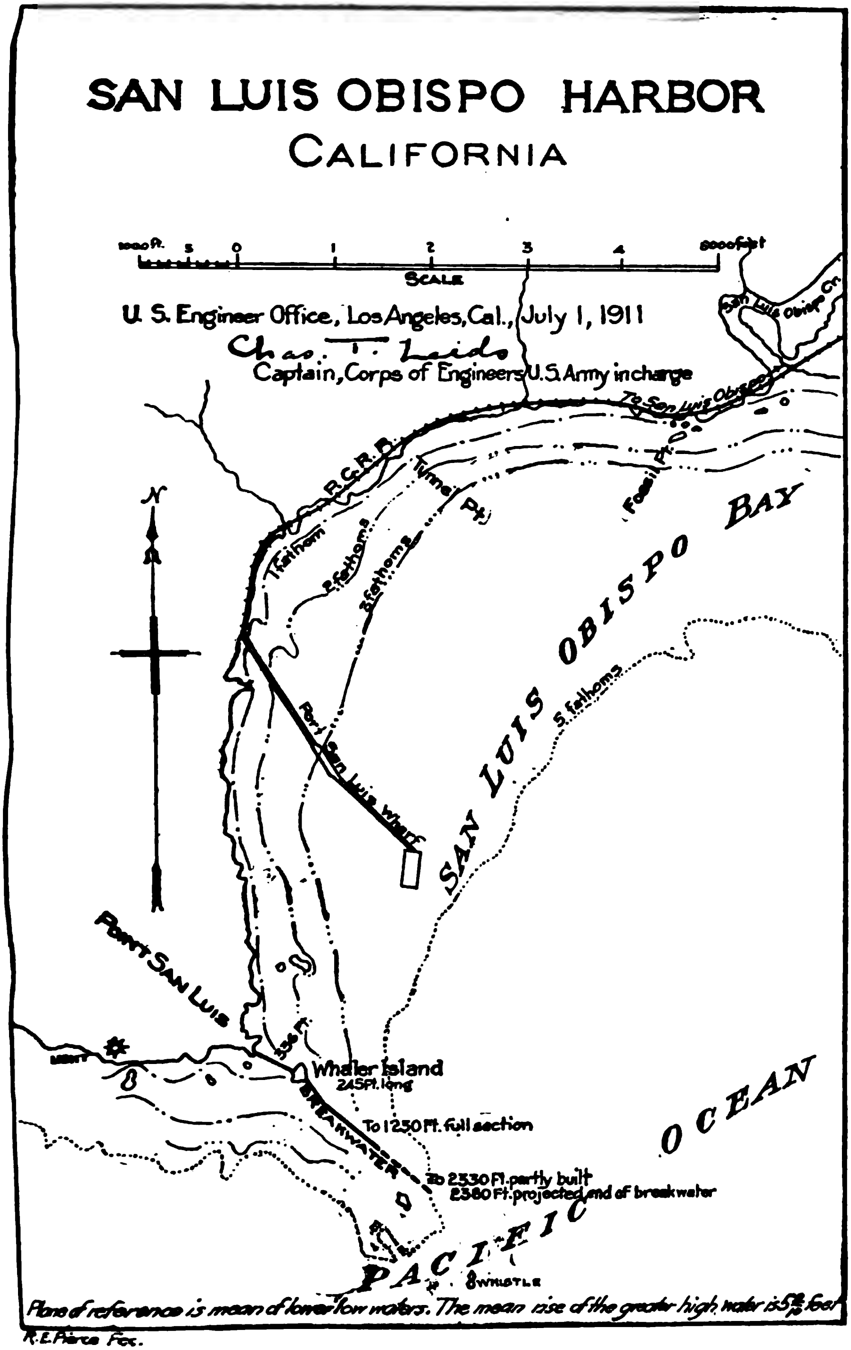
Season of navigation.—Year 1910: Open entire year.

Vessel classification.

Classes.	American.	Foreign.	Total.
Registered:			
Steamers	331		331
Sailing	29		29
Unregistered, steamers		28	28
Total	360	28	388

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Estimated valuation.
Crude oil	6,808,240 barrels	1,134,710	$5,106,180
Lumber	9.615,726 feet b. m	14,967	144,236
Piles	842	440	4,210
Ties	17,312	664	6,059
Shingles	2,613,450	351	7,840
Grain		8,767	263,010
Asphaltum		4.224	63,360
General merchandise		13.305	2,661,000
Total		1,177,428	8,255,895



SAN LUIS OBISPO HARBOR

CALIFORNIA

U. S. Engineer Office, Los Angeles, Cal., July 1, 1911

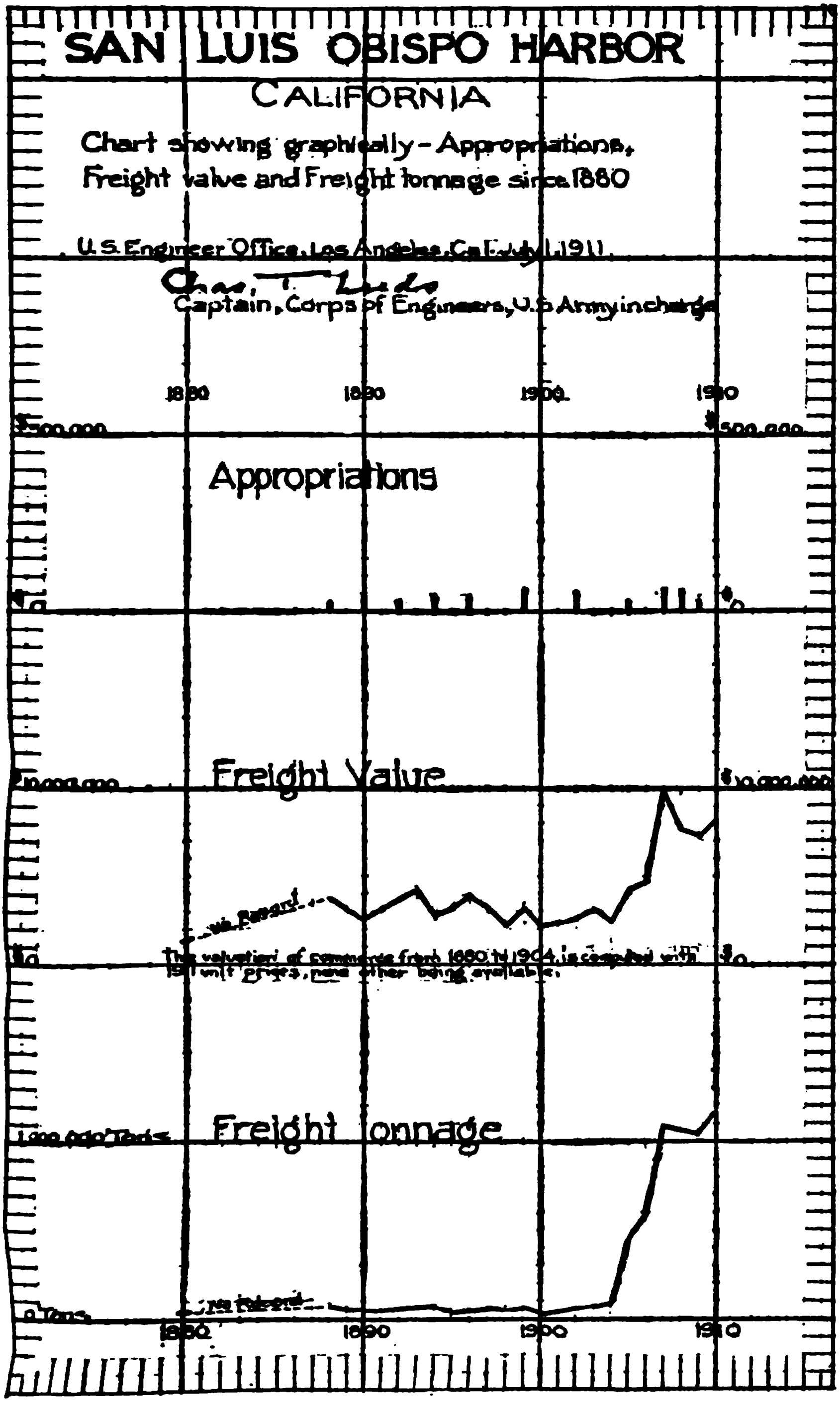
Chas. T. Leeds

Captain, Corps of Engineers, U. S. Army in charge

Plane of reference is mean of lower low waters. The mean rise of the greater high water is $5\frac{8}{10}$ feet

R. E. Pierce Fec.

2530-1



SAN LUIS OBISPO HARBOR

CALIFORNIA

Chart showing graphically - Appropriations, Freight value and Freight tonnage since 1880

U.S. Engineer Office, Los Angeles, Cal. July 1, 1911.

Chas. T. Leeds
Captain, Corps of Engineers, U.S. Army in charge

This valuation of commerce from 1880 to 1904 is computed with 1911 unit prices, none other being available.

250-2

APPENDIX R R.

IMPROVEMENT OF RIVERS AND HARBORS IN THE FIRST SAN FRANCISCO, CAL., DISTRICT.

REPORT OF COL. JOHN BIDDLE, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Harbor at San Francisco, Cal.
2. Redwood Creek, Cal.
3. Oakland Harbor, Cal.
4. San Pablo Bay, Cal.
5. Suisun Channel, Cal.
6. San Joaquin River, Cal.
7. Stockton and Mormon Channels, Cal.
8. Mokelumne River, Cal.
9. Petaluma Creek and Napa River, Cal.
10. Humboldt Harbor and Bay, Cal.

United States Engineer Office,
San Francisco, Cal., July 10, 1911.

Sir: I have the honor to transmit herewith the annual report of river and harbor works under my charge for the fiscal year ending June 30, 1911.

Very respectfully,
John Biddle,
Colonel, Corps of Engineers.

The Chief of Engineers, United States Army.

R R I.

IMPROVEMENT OF HARBOR AT SAN FRANCISCO, CAL.

No work was done in the field during the year, and no money has been expended. Specifications for a contract for removing Rincon Reef and Centissima Rocks were submitted and approved, and bids for doing the work have been called for by advertisement in the usual way.

There has been no deterioration at any time on any part of the improvement at this locality. All works of improvement have been permanent and will remain so. There is, however, a gradual deterioration of San Francisco Harbor, due to material carried down by the Sacramento, San Joaquin, and various small rivers, and to land reclamation. This has shown itself up to date mostly by shoaling along the shores and in Suisun Bay. The depths of the main channels have not as yet shown indications of shoaling, nor has the outer bar. It is considered desirable to carefully police the harbor to prevent unauthorized deposits and reclamation. In this way it is thought that future deterioration may be in part controlled. The entrance over the bar is at present sufficient, and the tidal prism should be kept at its maximum to maintain this condition. The main channel by Bonita Point, with 8 fathoms, is somewhat dangerous in rough weather, and it may prove desirable at some future date to dredge a deep channel straight out across the bar.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $140,000

APPROPRIATIONS.

Total of appropriations to Dec. 31, 1902	[2] $485,927.84
Mar. 4, 1911	30,000.00
Total	515,927.84

COMMERCIAL STATISTICS.

Season of navigation.—Opened January 1; closed December 31.

Vessel classification.

Classes.	Total.	Net registered tonnage.	Passengers.
Steamers	2,364	9,896,590	29,921
Sailing	350	1,506,938	
Total	2,714	11,403,528	29,921

It was impossible to obtain any exact detailed information as to vessel classification, but the above was obtained from the vessel register at the Merchants' Exchange.

Freight traffic.

Articles.	Amount in short tons.	Valuation.
Flour	98,069	$6,670,052
Corn	6,320	221,200
Wheat	143,104	5,724,160
Barley	543,407	16,302,210
Oats	29,869	896,070
Beans	46,913	3,753,040
Hay	214,734	4,079,946
Onions	16,815	1,825,200
Bran	16,865	578,410
Potatoes	98,415	3,936,600
Lumber	1,599,275	20,790,575
Shingles	34,087	1,157,258
Brick, cement, lime, etc	62,814	1,367,038
Coal, coke, etc	623,174	7,276,328
Crude oil	2,786,980	13,934,900
Paper	22,107	2,210,700

[1] Exclusive of the balance unexpended July 1, 1911.

[2] Of this amount $3,470.32 was turned into the Treasury.

Freight traffic—Continued.

Articles.	Amount in short tons.	Valuation.
Wines, liquors, etc	101,269	$20,253,800
Fertilizer	25,170	830,610
Salmon, codfish, etc	89,180	15,723,656
Butter, eggs, cheese, etc	26,984	11,436,440
Fruits, dried fruits, etc	86,553	10,470,950
Sugar, tea, coffee, canned goods	295,089	38,342,350
Silk, cotton, dry goods, leather	31,159	13,370,800
Wool, gunnies, matting, jute, etc	29,182	5,836,400
Rice, salt, coal oil, etc	33,709	1,849,205
Railroad ties, pig iron, etc	116,302	1,528,762
Miscellaneous	147,062	12,676,488
Total	7,324,577	222,478,148

R R 2.

IMPROVEMENT OF REDWOOD CREEK, CAL.

During the year a contract was entered into with J. C. Franks for dredging this creek to obtain the channel required by approved project. The contractor experienced considerable difficulty in finding a place for disposing of material, and work progressed slowly. Up to June 30, 1911, a total of 68,650 cubic yards had been excavated at a unit price of 9.73 cents per cubic yard.

Dredging of this creek being in progress at the end of the year, there has been no deterioration. Deterioration in the future may be expected, and it is proposed to use the balance remaining after completion of present contract for maintenance as needed.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $1,000

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902	[2] $31,800
June 25, 1910	12,000
Total	43,800

CONTRACT IN FORCE.

Contract dated January 31, 1911, for dredging 100,000 cubic yards of material from Redwood Creek, Cal.:

Rate: 9.73 cents per cubic yard.
Name of contractor: J. C. Franks.
Date of commencement: April 24, 1911.
Date of completion: Not completed at end of year.
Date of approval: February 8, 1911.
Date of expiration: May 23, 1911.

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[1] Exclusive of the balance unexpended July 1, 1911.

[2] Of this amount, $357.34 was returned to the Treasury.

COMMERCIAL STATISTICS.

Vessel classification.

It has been impossible to obtain any exact data as to the classification of the vessels using this stream.

Freight traffic.

Articles.	Amount in short tons.	Valuation.
Hides for tanning	3,490	$97,600
Tan bark	11,930	231,985
Other tanning products	902	70,335
Crude oil	3,300	28,000
Crude salt	14,000	55,860
Codfish	1,680	234,000
Boxes, tins, cooperage	480	13,320
Salt for curing fish	720	2,500
Lumber	6,600	184,800
Brick	522	7,837
Sand and gravel	1,260	3,850
Lime	220	2,200
Sewer pipe	420	3,350
Coke and coal	330	2,910
Wood	355	2,050
Building iron	650	17,500
Machinery	140	25,000
Gasoline, oil, paints	100	8,000
Hay	1,150	7,920
Wheat, barley, oats	137	2,050
Oysters, clams, fish	115	9,500
Miscellaneous	100	3,050
Total	48,601	1,007,967

R R 3.

IMPROVEMENT OF OAKLAND HARBOR, CAL.

At the beginning of the year a dredging contract was in force with the San Francisco Bridge Co. for dredging in this locality to obtain a channel 300 feet wide and 25 feet deep from Fallon Street to the tidal basin, and a 300-foot channel 17 feet deep around both sides of the tidal basin. This contract was completed July 20, 1910. The price paid was 18.8 cents per cubic yard, place measurement, and the quantity of material removed during the fiscal year was 102,785 cubic yards. In addition, 125,400 cubic yards were allowed for overdepth dredging, and paid for at 9.25 cents per cubic yard. Upon completion of contract the sum of $9,400 was paid contractor as retained percentages. The total amount removed under this contract was 2,148,838 cubic yards.

On November 15, 1910, a new contract was entered into with this same company for dredging about 1,289,200 cubic yards of material to deepen the present 25-foot channel to 30 feet deep at low water to a width of 300 feet and extending from the 30-foot contour in San Francisco Bay to the Webster Street Drawbridge. This contract was still in force at the end of the year. The price paid was 11.4 cents per cubic yard, place measurement, and the quantity of material removed under this contract during the fiscal year was 458,993 cubic yards.

On December 15, 1910, a contract was entered into with Frederick C. Roberts & Co. for placing the three Government drawbridges across the tidal canal in satisfactory condition for operation of their draws by electricity for a lump-sum price of $16,100.

Owing to delay in obtaining certain electric motors from the East the work of completing this contract was somewhat delayed. Under this contract six systems of automatically operated highway gates were installed with their equipment; all old machinery was overhauled, cleaned, and put in good condition; the required electrical machinery, wiring, etc., was installed; and a control house was installed on each bridge. The contractor was paid a total of $12,636. The contract is all completed except the installation of two 30-horsepower motors, two 15-horsepower motors, one 10-horsepower motor, and incidental minor connections.

In addition to the above contract, the flooring on the Fruitvale Avenue Bridge was patched and finally renewed at a total cost of $176.48. The reflooring of the Park Street Bridge was in progress at the end of the year. Work to the extent of about $975 had been completed. In addition, some extra work was done by Frederick C. Roberts & Co. at a total cost of $225.

For further particulars as to transfer of these bridges to local authorities, see page 2350, Report of the Chief of Engineers, 1910.

The deterioration in the Government works at this locality consists of shoaling in the main ship channel and natural deterioration of the three bridges. From recent cross sections of the channel it is estimated that the deterioration that has taken place in the ship channel since the completion of prior contracts amounts to about 753,000 cubic yards west of Webster Street Drawbridge and about 1,500,000 cubic yards east of this bridge and around the tidal basin. The estimated cost of removing this shoaling is 10 to 11 cents per cubic yard. The rapid shoaling, especially in the channels around the tidal basin, renders the question of maintenance very serious. Certain shoaling was to be expected, as both banks of the tidal basin are of soft flowing mud, and the center flat is kept in more or less agitation by vessels anchored on this flat. In the waters of San Francisco Bay material is almost constantly carried in suspension, and would naturally deposit in the tidal basin. As the dredging is continued, however, it is possible that the shoaling may become less, due to flatter slopes of the banks. The desirability of water front in San Francisco Bay and adjoining waters makes it worth while to attempt to maintain these depths.

As the three bridges have been put in good repair and will soon be turned over to the local authorities for operation as drawbridges, maintenance, and repairs, there will be no further charge to the Government on their account.

COMMERCIAL STATISTICS.

Season of navigation.—Opened, January 1; closed, December 31.

Vessel classification.

Classes.	American.	Foreign.	Total.
Registered:			
Steamers	1,432	22	1,454
Sailing	1,447	18	1,465
Unregistered:			
Unrigged	1,243		1,243
Tugs (steam)	14		14
Do	[1] 817		[1] 817
Tugs (gasoline)	25		25
Do	[1] 7,167		[1] 7,167
Yachts	[1] 136		[1] 136
Total	[2] 4,161 [1] 8,120	40	[2] 4,201 [1] 8,120

[1] Number of trips. [2] Number of vessels.

Freight traffic.

Articles.	Amount in short tons.	Va
Lumber and building materials	630,000	$3,
Crude oil, etc	250,000	1,
Hay, grain, farm products, etc	14,000	
Coal	21,217	
Miscellaneous	913,713	45,
Total carried by merchant vessels	1,828,930	50,
Total carried by ferries	1,746,441	87,
Grand total	3,575,371	138,

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance .... [1] $100,

APPROPRIATIONS.

Total of appropriations to Dec. 31, 1902	[2] $2,550,600.00
Mar. 3, 1903	131,000.00
Apr. 28, 1904	19,000.00
Mar. 3, 1905	100,000.00
June 30, 1906	81,000.00
Mar. 2, 1907	68,203.00
Mar. 4, 1907	23,000.00
May 27, 1908	190,000.00
Mar. 3, 1909	15,000.00
Mar. 4, 1909	$256,000.
Received by reimbursement from Isthmian Canal Commission	17.
Received from sale of typewriters	35.
June 25, 1910	250,000.
Feb. 27, 1911	150,000.
Total	3,833,855.61

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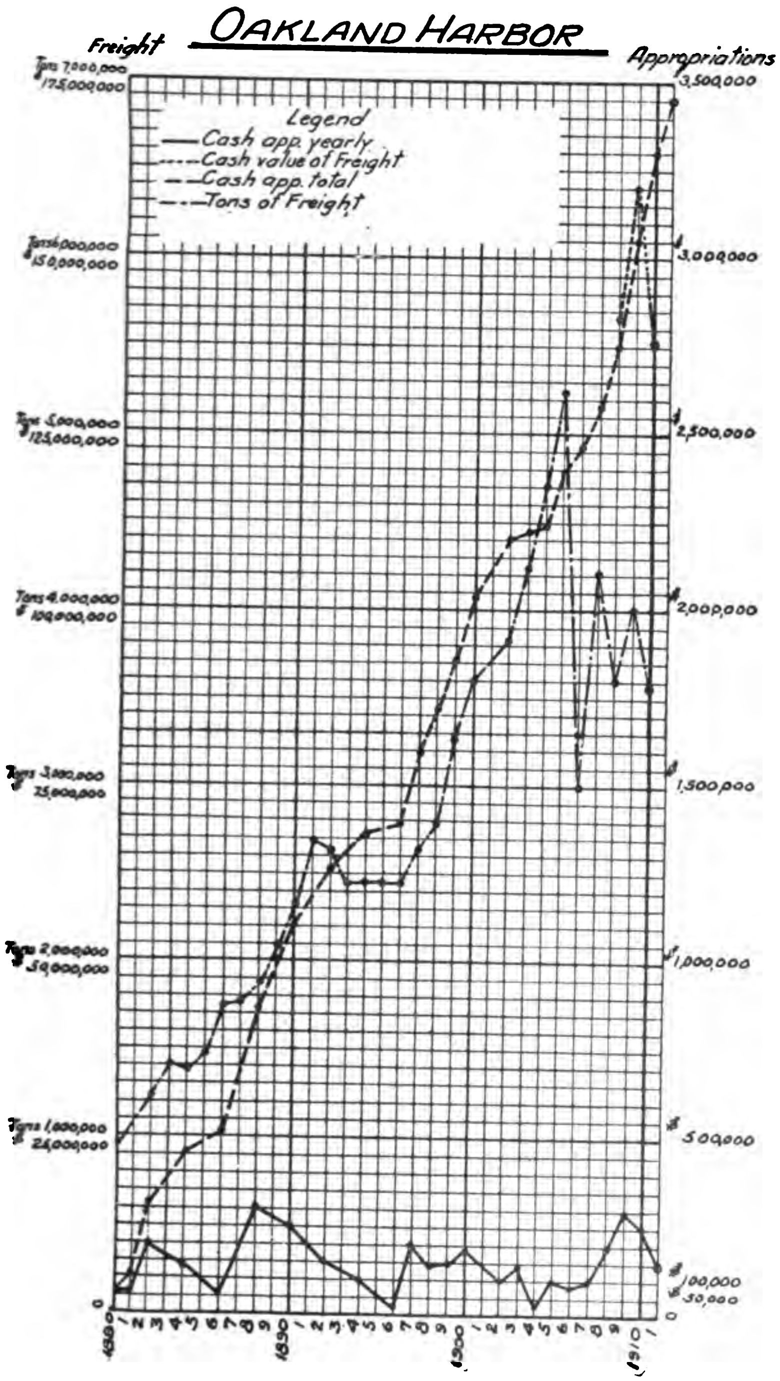
[1] Exclusive of the balance unexpended July 1, 1911.
[2] See H. Doc. No. 421, 57th Cong., 2d sess., p. 236.


OAKLAND HARBOR
Freight
Appropriations
Legend
——Cash app. yearly
-----Cash value of Freight
— —Cash app. total
—·—Tons of Freight
Tons 7,000,000
175,000,000
Tons 6,000,000
$ 150,000,000
Tons 5,000,000
$ 125,000,000
Tons 4,000,000
$ 100,000,000
Tons 3,000,000
$ 75,000,000
Tons 2,000,000
$ 50,000,000
Tons 1,000,000
$ 25,000,000
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CONTRACTS IN FORCE.

Contract dated May 4, 1908, for dredging about 1,916,700 cubic yards of material from Oakland Harbor, Cal.
Rate: 18.8 cents per cubic yard.
Name of contractor: San Francisco Bridge Co.
Date of commencement: May 23, 1908.
Date of completion: July 20, 1910.
Date of approval: May 29, 1908.
Date of expiration: December 6, 1910.

Contract dated November 15, 1910, for dredging about 1,289,200 cubic yards of material from Oakland Harbor, Cal.
Rate: 11.4 cents per cubic yard.
Name of contractor: San Francisco Bridge Co.
Date of commencement: December 30, 1910.
Date of completion: Work still in progress.
Date of approval: November 29, 1910.
Date of expiration: June 6, 1913.

Contract dated December 15, 1910, for placing 3 drawbridges across the Oakland Harbor Tidal Canal in satisfactory condition for operation of their draws by electricity.
Rate: $16,100.
Name of contractor: Frederick C. Roberts & Co.
Date of commencement: January 18, 1911.
Date of completion: Work still in progress; not yet completed.
Date of approval: December 28, 1910.
Date of expiration: June 29, 1911.

R R 4.

IMPROVEMENT OF SAN PABLO BAY, CAL.

The only work done during the year was a hydrographic survey to determine the extent of deterioration of the dredged channel through Pinole Shoal and its vicinity. The survey showed a total obliteration of this channel, but there is an available depth generally of about 2 feet more over this shoal than could be found prior to the dredging of the channel.

An estimate of cost of restoring this channel to its original dimensions was given in the Report of the Chief of Engineers for 1910, page 2352.

Congress having adopted the new project on February 27, 1911, for an enlarged channel, specifications were prepared for dredging this new channel by contract.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $200,000

APPROPRIATIONS.

June 13, 1902	$100,000.00
Mar. 3, 1903	200,000.00
June 30, 1906	53,168.41
Feb. 27, 1911	400,000.00
Total	753,168.41

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[1] Exclusive of the balance unexpended July 1, 1911.

COMMERCIAL STATISTICS.

The commerce passing through San Pablo Bay includes all that coming to San Francisco from the Sacramento, San Joaquin, and Napa Rivers, and Petaluma Creek, which, being all carried on stern-wheel flat-bottom river steamers and barges, is not particularly benefited by the deep channel over the shoal. However, all the commerce of Karquines Straits and Port Costa, which is mostly carried on deep-sea ships, and all vessels going to and from Mare Island Navy Yard are benefited by the dredged channel.

R R 5.

IMPROVEMENT OF SUISUN CHANNEL, CAL.

No work has yet been done on this channel, and no money has been spent.

The necessary land for the rights of way for the proposed cut-offs on the slough and the harbor at Suisun has not been transferred to the United States, but it is expected that this will be accomplished in the near future and that construction work will soon be commenced.

There has been no work of improvement at this locality, and consequently no deterioration of improvement.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $12,500

APPROPRIATIONS.

June 25, 1910	$12,500

COMMERCIAL STATISTICS.

Vessel classification.

It has been impossible to obtain any exact data as to the classification of the vessels using this stream.

Freight traffic.

Articles.	Amount in short tons.	Valuation.
Lumber	3,610	$50,000
Sand	240	168
Brick	150	800
Cream	125	12,500
Potatoes	400	8,000
Fuel oil	66,244	201,888
Hay	700	7,000
Barley	1,600	32,000
Miscellaneous	110	5,000
Total	73,179	317,356

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[1] Exclusive of the balance unexpended July 1, 1911.

R R 6.

IMPROVEMENT OF SAN JOAQUIN RIVER, CAL.

At the beginning of the fiscal year it was found that to obtain a channel in Stockton Channel 200 feet wide and 9 feet deep at low water, as required by the project adopted by Congress on June 25, 1910, would require the removal of about 170,000 cubic yards. It was also found from a survey that it would require the removal of about 90,000 cubic yards additional to extend this channel 75 feet wide and 4 feet deep at low water up Mormon Slough to Miller's warehouse, a distance of 4,500 feet. This work was done under contract and completed in January, 1911, and the full channel dimensions required by approved project were thereby obtained. There was a total of 275,285 cubic yards dredged at a contract price of 6.89 cents per cubic yard.

The floods in the early part of 1911 brought down large quantities of detritus that was not carried off by the diverting canal to the east. From a survey made recently it was found that the deterioration in Mormon Slough amounts to about 34,000 cubic yards. It is estimated it would cost about 7 cents per yard to redredge this channel with a clamshell dredge.

So far Stockton Channel has escaped deterioration from this source, but it is probable that another rainy season will carry the material on into the channel where it will have to be removed by hydraulic dredge at about 12 to 15 cents per cubic yard.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance	[1] $100,000

APPROPRIATIONS.

Aug. 14, 1876	$20,000	Mar. 3, 1899	$20,000
June 14, 1880	20,000	June 13, 1902	18,000
Mar. 3, 1881	40,000	Allotted from act of Apr. 28, 1904	35,170
Aug. 2, 1882	40,000	Mar. 3, 1905	20,000
July 5, 1884	20,000	Mar. 2, 1907	30,000
Aug. 5, 1886	18,750	Mar. 3, 1909	20,000
Aug. 11, 1888	25,000	June 25, 1910	75,000
Sept. 19, 1890	75,000	Feb. 27, 1911	25,000
July 13, 1892	65,000		
Aug. 18, 1894	50,000		
June 3, 1896	57,750	Total	674,670

CONTRACT IN FORCE.

Contract dated September 23, 1910, for dredging about 257,000 cubic yards of material from Stockton Channel and Mormon Slough, Cal.:
Rate: 6.89 cents per cubic yard.
Name of contractor: Antioch Dredging Co.
Date of commencement: October 3, 1910.
Date of completion: January 7, 1911.
Date of approval: Emergency contract, not approved by Chief of Engineers.
Date of expiration: January 1, 1911.

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[1] Exclusive of the balance unexpended July 1, 1911.

COMMERCIAL STATISTICS.

Season of navigation.—Opened, January 1; closed, December 31.

Vessel classification.

Classes.	American.	Net registered tonnage.	Passengers.
Registered:			
Steamers	1,031	428,306	62,500
Schooners	98	5,136	....
Barges	467	52,389	....
Unregistered:			
Launches	130	....	62,500
Barges	27	3,000	....
Total	1,753	488,831	125,000

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Cents.*
Mill stuffs	....	96,445	$4,822,250	100	1 3/16
Grain	....	172,537	6,901,480	90	1¼
Hay	....	4,061	40,610	100	1 3/16
Cord wood	3,325 cords	4,987	24,937	50	1 3/16
Merchandise	....	222,434	16,682,550	90	1¼
Tan bark	2,681 cords	2,016	47,092	100	1 3/16
Lumber	21,323,966 feet	39,816	522,647	100	1 3/16
Potatoes	....	48,062	956,240	75	1¼
Onions	....	18,615	376,030	100	1 3/16
Beans	....	12,993	649,650	50	1¼
Fruit and vegetables	....	4,401	216,440	100	1 3/16
Vehicles	1,625	814	1,300,000	100	....
Live stock	11,512 head	4,500	338,182	100	....
Total	....	631,681	32,878,108	....	....

R R 7.

IMPROVING STOCKTON AND MORMON CHANNELS, CAL.

At the beginning of the year work was in progress under contract with the Standard American Dredging Co. on the canal section of the Diverting Canal being constructed to divert the waters of Mormon Slough across the country east of Stockton and into the Calaveras River. Work was completed on September 3, 1910, a total of 87,437 cubic yards having been excavated during the year at a cost of 15½ cents per cubic yard. A total of 1,465,563 cubic yards of material was excavated in constructing this Diverting Canal, one railroad and six highway bridges were built, and one railroad bridge was extended.

In September, 1910, the Diverting Canal was cleaned of weeds, willows, and brush by hired labor at a total cost of $378.85.

This canal was given a severe test during the early part of this year when a succession of floods caused unusually high water several times, but the levee on the lower side of the canal proved ample to withstand all water turned into the canal. Considerable driftwood was lodged against the bridges over the canal, some pile supports were knocked out, approaches to the bridge were washed out, and the retaining levee broken at one place. All damage done to bridges and approaches except in the case of the Sanguinetti Bridge was repaired by hired labor at a total cost of $2,966.54, including some incidental expenses. The country to the east and north of the canal was flooded for several miles and damage was done to early crops, fences, and buildings. As far as is known, the damage done to the land was not permanent and the land has been put into crops this year. Considerable additional expense for pumping was rendered necessary in some cases. It is not thought that the damage can be attributed solely to the diverting canal. The floods in this section were greater than usual and the levees on the Calaveras River above the canal had been allowed to deteriorate so as to be of little value. With the funds available it is not practicable to make the canal of sufficient size to carry all the flood water, but the channel will be cleared at the more congested parts.

This canal, however, does not entirely fulfill the purpose of the project to keep material out of Stockton Channel. The south bank of Mormon Slough above the head of the canal is overflowed at high water and considerable quantities of detritus are carried down into the improved channel in Mormon Slough and will doubtless extend into Stockton Channel in the course of time. This had been foreseen and the city of Stockton and private owners informed. The Diverting canal and levees protected the city of Stockton from being flooded two or three times during the rainy season.

The high water scoured out the channel in the full length of the Canal, and it is now in better condition that it was when first completed.

Aside from the above flood damage very little deterioration to Government works at this locality has taken place, as all the works have been but recently constructed. It is proposed to expend the balance on hand in increasing the water-carrying capacity of the channel.

This improvement is considered worthy of maintenance to divert the waters of Mormon Slough away from Stockton Channel and save some of the expensive annual dredging found necessary in past years.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $25,000

APPROPRIATIONS.

June 13, 1902	$50,000
Mar. 3, 1903	50,000
Apr. 28, 1904	75,000
Mar. 3, 1905	49,316
Mar. 4, 1909	56,079
Total	280,395

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[1] Exclusive of the balance unexpended July 1, 1911.

CONTRACT IN FORCE.

Contract dated August 15, 1908, for excavating 834,100 cubic yards of material and building embankments and dam at 15.5 cents per cubic yard, and building bridges at $1,623, $1,753, $1,493, $1,429, and $5,500 each.
Name of contractor: Standard American Dredging Co.
Date of commencement: November 3, 1908.
Date of completion: September 3, 1910.
Date of approval: August 24, 1908.
Date of expiration: March 18, 1910, under supplemental contract.

R R 8.

IMPROVEMENT OF MOKELUMNE RIVER, CAL.

Toward the end of the preceding year a clamshell dredge was leased from N. R. Harris at a rate of $125 per day of 22 hours. This dredge was employed in cutting the channel through sand bars and removing overhanging limbs and trees. Work was completed on July 20, 1910, having removed a total of about 30,000 cubic yards of material at a total cost of $1,801.14. In addition to work by the United States, the State of California and private parties did considerable work above the Galt-New Hope Bridge, the upper limit of the present project. This made a navigable channel 2 or 4 miles in length and the amount of money expended thereon is reported as being $22,782.39. From observation it is found that this part of the river is as yet used little for commerce, but the improvement is valuable in facilitating flood control.

It is impossible to state the amount of deterioration of the channel of this river without a survey. Repairs are usually best effected by leasing a dredge for about $125 per day of 22 hours.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $1,000

APPROPRIATIONS.

Total of appropriations to Dec. 31, 1890	[2] $13,000
July 13, 1892	2,500
Aug. 18, 1894	2,500
Mar. 3, 1905	2,500
Mar. 2, 1907	2,500
June 25, 1910	2,000
Feb. 27, 1911	5,000
Total	30,000

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[1] Exclusive of the balance unexpended July 1, 1911.
[2] See H. Doc. No. 421, 57th Cong., 2d sess., p. 236.

CONTRACT IN FORCE.

Contract dated June 9, 1910, for lease of clamshell dredge *Golden Gate*, for dredging in Mokelumne River, Cal.

Name of contractor: N. R. Harris.
Rate: $125 per day of 22 hours.
Date of commencement: June 16, 1910.
Date of completion: July 20, 1910.
Date of approval: Emergency contract not approved by Chief of Engineers.
Date of expiration: July 29, 1910.

COMMERCIAL STATISTICS.

Vessel classification.

It has been impossible to obtain any detailed information in regard to the vessel classification for this stream.

Freight traffic.

Articles.	Amount in short tons.	Valuation.
Fruit	187	$5,480
Potatoes and onions	30,034	1,201,360
Beans	4,191	272,415
Grain and flour	843	29,505
Vegetables	1,107	14,421
Canned goods	594	59,400
Lumber	692	10,380
Vehicles	22	22,000
Live stock	507	101,400
Merchandise	6,076	1,215,200
Total	44,203	2,931,561

R R 9.

IMPROVEMENT OF PETALUMA CREEK AND NAPA RIVER, CAL.

(A) PETALUMA CREEK.

Contract was entered into during the year with N. R. Harris to dredge the upper part of Petaluma Creek at a contract price of 11.74 cents per cubic yard. A total of 80,862 cubic yards was removed and the full width and depth of channel required by approved project was obtained. Aside from the channel in the creek proper, there has been a gradual shoaling in San Pablo Bay at the approach to the mouth of the creek. This shoaling has been accumulating for many years, and now it seriously hampers navigation in and out of the creek. No work has ever been done at this point, so that this can not be considered strictly a deterioration of any work of improvement.

This locality is considered worthy of further improvement to the extent of maintaining the present authorized channel in the creek proper, and also providing a channel of corresponding width and depth across the flats in San Pablo Bay at the approach to the mouth of the creek.

The amount of deterioration of the channel of this creek is estimated at 34,000 cubic yards, and the cost of removing this material is estimated at 16 cents per cubic yard.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $5,000

APPROPRIATIONS.

Total of appropriations to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess., p. 237)	$68,000
Mar. 3, 1905	2,000
Mar. 2, 1907	15,239
Mar. 3, 1909	10,000
Mar. 12, 1909 (allotted by transfer of funds)	2,000
June 25, 1910	5,000
Feb. 27, 1911	7,000
Total	109,239

CONTRACT IN FORCE.

Contract dated November 9, 1910, for dredging about 65,307 cubic yards of material from Petaluma Creek, Cal.

Rate: 11.74 cents per cubic yard.

Name of contractor: N. R. Harris.

Date of commencement: December 8, 1910.

Date of completion: January 22, 1911.

Date of approval: November 17, 1910.

Date of expiration: March 8, 1911.

COMMERCIAL STATISTICS.

Vessel classification.

Classes.	American.	Net registered tonnage.	Passengers.
Registered:			
Steamers	8	2,228.45	
Sailing	73	3,650.00	
Unregistered:			
Sailing	12	480.00	
Yachts	25		
Tugs	10		
Total	128	6,358.45	6,821

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[1] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount in short tons.	Valuation.
Butter	156	$93,600
Cream	312	6,200
Poultry	1,521	724,000
Eggs	11,700	280,800
Lumber	26,024	287,880
Wine	8,000	620,000
Silk	143	234,000
General merchandise	30,887	2,668,675
Feed and grain and millstuffs	97,224	3,082,222
Berries	1,200	60,000
Apples	1,400	56,000
Live stock	360	90,000
Hides, leather, wool	2,830	558,000
Total	181,757	8,761,377

(B) NAPA RIVER.

The only work done on this locality during the year was the removal of nine trees from a portion of the bank that was sliding into the river, taking the trees with it. This work was done by hired labor at a total cost of $45.

There is need of making two cut-offs in this river at Car Bend and at Jack's Bend. It will be necessary to modify the existing project for this locality in order to provide for these cut-offs. The present project was based on a preliminary examination and survey made in compliance with the river and harbor act of July 5, 1884, and the report thereon is printed in Report of the Chief of Engineers for 1885, page 2343. The bends mentioned are pronounced; they make navigation difficult even with a good depth of channel, and the tendency to shoal is much greater at these bends than elsewhere along the river. If cut-offs were made here, the cost would not be great, and the current being given a direct course should keep the channel open. The use of the whole river would be greatly facilitated and redredging should be much less frequent. The local authorities are willing to furnish the necessary land free of cost for the right of way for each cut-off. It is recommended that the present project for this locality be modified so as to provide for making these two cut-offs.

The amount of deterioration in the channel of this river since the last dredging in May, 1910, is estimated at about 24,000 cubic yards. To remove this material will cost about 12 cents per cubic yard.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $5,000

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[1] Exclusive of the balance unexpended July 1, 1911.

APPROPRIATIONS.

Aug. 11, 1888	$7,500.00
Sept. 19, 1890	10,000.00
Aug. 18, 1894	4,000.00
June 3, 1896	4,000.00
June 13, 1902	3,000.00
Apr. 28, 1904 (allotted)	4,429.36
Mar. 3, 1905	1,000.00
Mar. 2, 1907	8,000.00
Mar. 3, 1909 (allotment)	5,000.00
Total	46,929.36
Mar. 12, 1909, withdrawn and allotted to Petaluma Creek	$2,000.00
	44,929.36
June 25, 1910	5,000.00
Feb. 27, 1911	4,000.00
Total	53,929.36

COMMERCIAL STATISTICS.

Season of navigation.—Opened January 1; closed December 31.

Vessel classification.

Classes.	American.	Net registered tonnage.
Registered:		
Steamers	3	851
Sailing	260	
Unrigged	20	
Unregistered, unrigged	18	
Total	301	851

Freight traffic.

Articles.	Amount in short tons.	Valuation.	Average haul or distance freight was carried.
			Miles.
General merchandise	29,309	$5,861,800	45
Fruit and vegetables	4,243	509,160	45
Lumber	6,112	213,920	45
Lime, cement, sand, etc	2,797	139,850	45
Wines, liquors, etc	3,941	197,050	45
Hay, grain, millstuffs, etc	5,341	534,100	40
Fuel oil	25,614	112,061	35
Gravel	120,460	120,460	40
Miscellaneous	5,043	252,150	45
Total	202,860	7,940,551	

R R 10.

IMPROVEMENT OF HUMBOLDT HARBOR AND BAY, CAL.

The project for rebuilding the jetties at this locality having been adopted by the river and harbor act of June 25, 1910, early in the fiscal year an assistant engineer was employed and sent to Eureka with instructions to study the situation and formulate a satisfactory and economical plan for obtaining stone and placing it in the jetties. Several weeks were spent on this investigation and it was decided to obtain stone by contract and place it in the jetties by hired labor. Specifications were prepared for furnishing several items of the proposed stone receiving and handling plant and some bids were called for, but owing to the fact that the funds available were insufficient for any practical plan of work, operations were suspended pending further appropriations.

The act of February 27, 1911, appropriated $170,000 for this work and placed it on the continuing-contract basis. The work was immediately taken up again and a suboffice was established at Eureka. Proposals were obtained for furnishing 500,000 tons of large stone and 44,000 tons of crushed rock, but at the end of the year contract had not been entered into. The construction of a stone-receiving and handling plant was in progress at the end of the year. This consists of a landing wharf, car ferry slip, railroad with locomotive and cars, a traveling crane and accessories. The total amount spent on this work during the year was $10,870.43.

In the meantime a survey of the jetty channel was made to determine its present condition and for use as a basis to ascertain definitely the progressive effect thereon of the rebuilt jetties. This survey was completed in April, 1911, at a total cost of $2,247.36.

During the latter part of the year a survey was made of channel in front of Eureka at a cost of $936.03.

Owing to the limited funds available and the high cost of bringing a dredge to this locality it will not be practicable to do any work on this channel until further funds are provided.

At the end of the year a survey was in progress to determine the tidal volume of Humboldt Bay and also to establish data whereby any decrease therein may be detected at any future time. A total of $720.74 had been spent on this survey.

The deterioration of the works at this locality consists of the damage by storms to the outer ends of both jetties and shoaling of the channel in front of Eureka. The cost of repairs to the jetties is estimated at $1,037,400, the basis of the present approved project for rebuilding them.

The shoaling of the channel in front of Eureka amounts to about 100,000 cubic yards and the cost of removal is estimated at 30 cents per cubic yard.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance	[1] $515,000

APPROPRIATIONS.

Total of appropriations to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess., p. 236)	$2,187,615
Mar. 2, 1907	83,000
June 25, 1910	150,000
Feb. 27, 1911	185,000
	2,605,615
Received from sale of unserviceable articles	6
Total	2,605,621

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[1] Exclusive of the balance unexpended July 1, 1911.

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Opened, January 1; closed, December 31.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
REGISTERED.					
Arrivals:					
Steamers	866	23	889	492,281	17,796
Sailing	28	7	35	25,362	
Departures:					
Steamers	863	23	886	496,527	18,219
Sailing	37	7	44	28,806	
Total	1,794	60	1,854	1,042,975	36,015

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Average haul or distance freight was carried.	Rate per ton-mile.
				Miles.	*Cents.*
Dairy products	8,501,880 pounds	4,251	$1,804,940	220	3[illegible]
Animal products	1,649,060 pounds	825	172,290	220	1[illegible]
Live stock	5,652,000 pounds	2,826	328,800	220	3[illegible]
Fish	1,925,350 pounds	963	158,000	220	2
Fruit	65,468 boxes	1,954	72,660	220	2
Grain	331 sacks	21	800	220	1
Vegetables	1,811 sacks	111	6,500	220	1
Manufactures	3,116,500 pounds	1,559	291,800	220	1[illegible]
General merchandise		81,958	4,169,350	235	1[illegible]
Miscellaneous		20,561	587,580	220	1[illegible]
Lumber	368,527,700 feet	591,310	6,552,560	400	[illegible]
Fuel oil	143,802 barrels	23,737	135,010	300	[illegible]
Coal	1,794 long tons	2,009	15,270	7,500	[illegible]
Hay		738	13,300	220	1
Machinery, iron, etc		2,957	438,290	220	2
Total		735,780	14,747,150		

APPENDIX S S.

IMPROVEMENT OF RIVERS AND HARBORS IN THE THIRD SAN FRANCISCO, CAL., DISTRICT.

REPORT OF MAJ. S. A. CHENEY, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENT.

Sacramento and Feather Rivers.

United States Engineer Office,
San Francisco, Cal., July 16, 1911.

Sir: I have the honor to forward herewith the annual report of the board of engineer officers for the improvement of the Sacramento and Feather Rivers, Cal., for the fiscal year ending June 30, 1911.

Very respectfully,

S. A. Cheney,
Major, Corps of Engineers.

The Chief of Engineers, United States Army.

REPORT OF BOARD OF ENGINEERS.

United States Engineer Office,
San Francisco, Cal., June 30, 1911.

Sir: The Board of Engineers created by the act of Congress approved June 3, 1896, "for the purpose of making surveys and examinations" of the Sacramento and Feather Rivers, to "submit the most feasible plan for the improvement of said rivers and the maintenance of navigation thereon, and to have charge of the work by them recommended as appropriations are made therefor," has consisted during the past fiscal year of Col. John Biddle, Maj. S. A. Cheney since April 12, 1911, Capt. Thos. H. Jackson to April 12, 1911, and Capt. Charles T. Leeds, Corps of Engineers.

For general information concerning the project for improvement attention is invited to the summary of this report.

For details concerning the operations during the past fiscal year attention is invited to the accompanying report of Maj. S. A. Cheney, Corps of Engineers, secretary and disbursing officer of the board, in immediate charge of the work. Great areas of land along the river are under a high state of cultivation, and practically all the territory along the river is dependent upon the stream for the transportation of passengers and freight. Much of the freight carried is of a perishable nature, and it is important that the navigable channels should not be permitted to deteriorate so that they can not be used to transport the products of the country to market promptly when ready for shipment.

Several of the companies operating regular lines of steamboats have added additional boats to their service during the past year, and several more boats, now building, will be added to the service during the coming year.

In its last annual report (printed in the Annual Report of the Chief of Engineers for 1910, pp. 2367-2368) the Board referred to the fact that the channel in the 61 miles of the Sacramento River between its mouth and the city of Sacramento showed signs of becoming impaired, by reason of the natural decay and deterioration of the wing-dam system built in the years 1899 to 1903. On account of the impaired condition of some of the wing dams, navigation was seriously interfered with in July and August, 1910, and it became necessary to resort to dredging in order to maintain the projected channel depth of 7 feet at Sacramento Bar and Brickyard Bar, short distances below the city of Sacramento.

It is estimated that the sum of $40,000 will be required for the Sacramento River improvement during the fiscal year ending June 30, 1913. Of this sum it is estimated that $17,500 will be needed to restore 3,500 linear feet of wing dams, at $5 per foot, and that the remainder will be needed to operate U. S. snag boat *Seizer* in removing snags, during six months, at a monthly expense of $3,750.

John Biddle,
Colonel, Corps of Engineers.
S. A. Cheney,
Major, Corps of Engineers.
Chas. T. Leeds,
Captain, Corps of Engineers.

The Chief of Engineers, United States Army.

REPORT OF MAJ. S. A. CHENEY, CORPS OF ENGINEERS.

During the past fiscal year the work of maintaining the navigable channels called for by the existing project in the 258 miles of the Sacramento River from its mouth to Red Bluff has consisted of removing obstructing snags, logs, and stumps from the channel, cutting trees on the banks, constructing temporary wing dams at Monroeville chute and Bowers Bar, dredging a shoal immediately above the bridge of the Southern Pacific Co., at Sacramento, dredging shoals at Sacramento Bar and Brickyard Bar, partially restoring the wing-dam system below Sacramento, and repairing U. S. snag boat *Seizer*. The operations in detail were as follows:

Removing obstructions.—The work of removing obstructing snags, etc., was carried on by hired labor, the U. S. snag boat *Seizer* with a crew of about 32 men being employed on this work during 72½ days, at a total cost of $12, 689.12. The following is a statement of the obstructions, etc., removed during the fiscal year by the snag boat and crew:

Between—	Distance.	Logs, trees, stumps, and snags blasted or removed from river.	Trees and stumps cut on banks.
	Miles.		
Collinsville and Sacramento	61	182	....
Sacramento and Colusa	90	117	5
Colusa and Chico Landing	51	968	70
Chico Landing and Red Bluff	56	32	....
Total	258	1,299	75

Constructing temporary wing dam at Monroeville chute.—During the month of July, 1910, a temporary wing dam was constructed, at a cost of $690, to concentrate the flow at Monroeville chute, about 5 miles below Chico Landing. This wing dam was built by the crew of the snag boat *Seizer*, the piles and brush for the dam being cut in the vicinity by the crew. This wing dam was 225 feet in length. It resulted in increasing the channel depth at Monroeville chute from 2 feet to 3½ feet. The materials used in constructing the dam were as follows:

Piles, willow, 8 inches in diameter, 8 feet long		90
Lumber, 2 by 6 inches	feet b. m..	360
Spikes	pounds..	50
Brush	cords..	170
Gravel	sacks..	45

Constructing temporary wing dam at Bowers Bar.—During July, 1910, a temporary wing dam was constructed, at a cost of $1,207.50, to concentrate the flow at Bowers Bar, about 10 miles below Chico Landing. This wing dam was built by the crew of the snag boat *Seizer*, with piles and brush cut in the vicinity by the crew. This wing dam was 300 feet in length. It resulted in increasing the channel depth at Bowers Bar from 2½ feet to 5½ feet. The materials used in constructing the dam were as follows:

Piles, willow, 8 inches in diameter, 8 feet long		120
Lumber, 2 by 6 inches	feet b. m..	480
Spikes	pounds..	75
Brush	cords..	265
Gravel	sacks..	75

Dredging shoal at Sacramento.—To maintain the channel depth of 4 feet required by the existing project, it became necessary in July, 1910, to dredge 17,549 cubic yards of material at a shoal above the bridge of the Southern Pacific Co. at Sacramento. This work was done by the Vulcan Dredging Co., of San Francisco, under oral agreement. The dredging was begun July 7 and was completed July 12, 1910. The cost of this dredging was $544.02.

Dredging at Sacramento Bar and Brickyard Bar.—Early in August, 1910, steamboats drawing 5 to 6 feet of water experienced difficulty at Sacramento Bar and Brickyard Bar, short distances below the city of Sacramento, and to maintain the channel depth of 7 feet required by the existing project it became necessary to dredge 29,100 cubic yards of material at those two bars. This work was done by reclamation district dredge *No. 551*, under an oral agreement. The dredging was begun August 15 and was completed August 31, 1910. The cost of this dredging was $1,746.17.

Rebuilding wing-dam system below Sacramento.—In the Annual Report of the Chief of Engineers for 1910 (p. 2368) mention was made of the necessity of rebuilding the more important portions of the wing-dam system below Sacramento, in order to maintain the channel depth of 7 feet required by the project. The necessity of beginning this work became urgent in July, 1910, the channel having become so impaired, on account of the decayed and deteriorated condition of some of the wing dams, that steamboats drawing 5 to 6 feet of water experienced difficulty in navigating. In order to do this work it became necessary to use funds which it had been intended to use to remove snags and other obstructions in the river above Sacramento. The wing-dam system built in former years at Sacramento Bar, Sutterville, Edwards break, Brickyard Bar, and Pocket Pump, all lying in the 10 miles of the river next below Sacramento, was restored by hired labor, and with materials purchased by circular advertisements and under oral agreements. In this work of restoration 11 wing dams were built, aggregating 1,576 linear feet, at a cost of $6,795.10. Each wing dam consisted of a double row of piles 4 to 5 feet apart, the piles in each row being 4 to 5 feet apart. The space between the rows of piles was filled with brush held in place by sand in sacks and waling strips. This work was begun in July, 1910. It was necessary to suspend the work on September 30, 1910, in order to assure that there would be some funds left available for removing snags and other obstructions in the river above Sacramento during the spring and summer of 1911.

Repairing U. S. snag boat Seizer.—The hull of the snag boat from the fireroom to the stern was practically rebuilt in 1909. The remainder of the hull, from the fireroom to the bow, was rebuilt during the past fiscal year, at a cost of $7,350.10. This work was done by hired labor, 25 men being ordinarily employed on the work. The materials for the repairs were purchased by oral agreement. The repairs were begun in March and completed in May, 1911.

The least low-water channel depths in the Sacramento River of 7 feet from its mouth to the city of Sacramento, and of 4 feet from the city of Sacramento to Colusa, required to be maintained under the existing project have existed during the past fiscal year, except during short periods in July and August, 1910, when steamboats experienced difficulty in navigating on account of bars above the railroad bridge at Sacramento, and at Sacramento bar and Brickyard bar, short distances below Sacramento.

The projected low-water channel depth of 3 feet from Colusa to Chico Landing has been maintained during the past year, although the unusually low stage to which the river fell in the summer of 1910 interfered more or less with the free navigation of that portion of the stream. As in previous years, from Chico Landing to Red Bluff, the projected least low-water channel depth of 3 feet existed during only a portion of the year, from January to July, 1911. On account of natural conditions it has not been found practicable to maintain the projected least low-water channel depth of 3 feet between Chico Landing and Red Bluff all the year around.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $40,000

APPROPRIATIONS.

Previous projects: Acts of Mar. 3, 1875, to Aug. 18, 1894, inclusive		$760,000.00
Present project, act of—		
Mar. 3, 1899	$30,000.00	
June 6, 1900	60,000.00	
June 13, 1902	25,000.00	
Apr. 28, 1904 (allotted)	22,000.00	
Mar. 2, 1907	50,000.00	
Mar. 3, 1909 (allotted Apr. 9, 1909)	25,000.00	
June 25, 1910	30,000.00	
Feb. 27, 1911	25,000.00	
		267,000.00
Receipts from sales		1,886.49
Total		1,028,886.49

CONTRACTS IN FORCE.

There were no contracts in force during fiscal year ending June 30, 1911.

COMMERCIAL STATISTICS.

The freight and passenger traffic on the Sacramento and Feather Rivers is handled by approximately 50 steamboats, 75 gasoline boats and launches, 45 barges, and in the lower portions of the Sacramento River by a number of gasoline and sail schooners. The freight carried during the year ending December 31, 1910, was as follows:

Articles.	Amount in short tons.	Valuation.
Brick	33,797	$81,099
Canned goods	5,404	864,640
Coal	5,507	55,070
Fruit	15,462	2,164,680
Grain	66,876	1,872,528
Hay	51,666	723,324
Livestock	2,997	359,640
Lumber	76,228	1,715,130
Vegetables	53,374	3,202,440
Miscellaneous merchandise	184,836	18,483,600
Total	496,147	29,522,151

Number of passengers carried during the year, 184,406.

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[1] Exclusive of the balance unexpended July 1, 1911.

APPENDIX T T.

IMPROVEMENT OF RIVERS AND HARBORS IN THE FIRST PORTLAND, OREG., DISTRICT.

REPORT OF MAJ. J. J. MORROW, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Coquille River, Oreg.
2. Entrance to Coos Bay and Harbor, Oreg.
3. Coos River, Oreg.
4. Mouth of Siuslaw River, Oreg.
5. Tillamook Bay and Bar, Oreg.
6. Snake River, Oreg., Wash., and Idaho.
7. Columbia River and tributaries between Celilo Falls and mouth of Snake River, Oreg. and Wash.
8. Columbia River between the foot of The Dallas Rapids and the head of Celilo Falls, Oreg. and Wash.
9. Canal at the Cascades, Columbia River, Oreg.
10. Operating and care of canal and locks at the Cascades of the Columbia River, Oreg.
11. Columbia River between Vancouver, Wash., and mouth of Willamette River.

United States Engineer Office,
Portland, Oreg., July 17, 1911.

Sir: I have the honor to transmit herewith annual report for the fiscal year ending June 30, 1911, pertaining to improvement of rivers and harbors in the first Portland, Oreg., district. * * *

Very respectfully,

J. J. Morrow,
Major, Corps of Engineers.

The Chief of Engineers, United States Army.

T T 1.

IMPROVEMENT OF COQUILLE RIVER, OREG.

Information concerning the status of work is given in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

No work was done in maintaining the jetties at the entrance completed in 1908. The jetties have remained in fairly good condition, although their outer ends were beaten down slightly by the heavy seas. The depth in the bar channel has been well maintained, and not less than 9 feet at low tide was reported.

The greater part of the old Government plant used in building the jetties in former years was transferred during 1910 to the port of Siuslaw commission for use in building the south jetty at the entrance to the Siuslaw River.

After the close of snagging operations on Coos River the Government snag scow used there was towed to Bandon January 3, 1911, and snagging operations commenced by hired labor at Coquille, working downstream, January 7. This snag scow has been in operation by hired labor to date, and its work has resulted in the removal of 1,505 snags, at a cost of $5,271.97, and in nearly clearing the river of snags as provided for in the project.

Early last fall plans for a new combined snag and drill scow, for use on the Coquille River, were prepared. The scow was constructed under contract with Kruse & Banks at North Bend, and towed to the Coquille River. It was fitted up with a steam drill and commenced the work of rock removal on rock "E" April 24, 1911. Total cost of scow, including equipment, was $6,661.

To the present date rocks E and D have been drilled, and rock E blasted, resulting in reduction of the rock from 2 feet above to 5 feet below mean lower low water, and work is in progress on the other rocks near Bandon. The drilling and blasting have cost to date $3,564.10.

On June 8 the dredge *Oregon* and two scows loaded with pontons and pipe were towed from Coos Bay to the Coquille River by the tug *Klyhiam*. On June 16 the dredge started work on the Bandon shoal, and had removed 28,504 cubic yards of material therefrom by the end of the fiscal year, at a cost of $4,387.20.

It is expected that the entire project will be completed by about next October or November, and the river left in good shape so that any vessels that can enter the mouth can safely pass up as far as Coquille, 25 miles above.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $2,000

APPROPRIATIONS.

Total appropriated to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$240,000
Mar. 3, 1905	55,000
Mar. 2, 1907	60,000
June 25, 1910	56,000
Total	411,000

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[1] Exclusive of the balance unexpended July 1, 1911.

CONTRACTS IN FORCE.

Name of lessor: Chris and Nels Rasmussen, Bandon, Oreg.
Date of lease: May 10, 1909.
Character: Hire and lease of one room.
Price: $7.50 per month.
Approved: Authorized by Chief of Engineers, April 21, 1908.
Date of beginning: May 10, 1909.
Date of expiration: May 9, 1911.
Renewed: May 10, 1911.
Date of expiration: May 9, 1913.

COMMERCIAL STATISTICS, 1910.

Vessel classification.

Classes.	American.	Net registered tonnage.	Passengers.
Unregistered (licensed and enrolled):			
Steamers	222	64,072	1,990
Sailing	69	5,214	
Gasoline	46	18,791	
Total	[1] 337	88,077	1,990

[1] Arrivals and clearances over the bar, irrespective of number of vessels.

Vessels plying the river only.

Classes.	American.	Net registered tonnage.	Passengers.
Unregistered (licensed and enrolled):			
Steamers	5	529	55,400
Gasoline	9	78	....
Total	14	607	55,400

Freight traffic.

Articles.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Broom handles	796,000	266	$33,990	$0.0075
Chittim bark	22 tons	22	2,200	.0125
Coal	2,758 tons	2,758	11,032	.0055
Dairy products	252 tons	252	57,680	.0228
Fish	505 tons	505	60,600	.017
Live stock	20 head	10	1,250	.0625
Lumber	42,215,811 feet b. m.	63,293	632,930	.005
Piles	44,605 linear feet	811	4,055	.0075
Logs [1]	77,909,809 feet b. m.	115,457	346,371	.002
Machinery	651 tons	651	65,100	.0325
Matchwood	5,015 cords	5,015	30,090	.0075
Miscellaneous	18,008 tons	18,008	1,800,800	.01
Railroad ties	16,760	838	6,704	.005
Shingles	26,760 bundles	446	13,380	.01
Vegetables	35 tons	35	1,400	.0075
Veneer	157 tons	157	31,400	.0075
Woolen goods	62 tons	62	31,000	.0075
Total	....	208,586	3,129,982	....

[1] Towed on the river with average haul 15 miles.

Average haul on portion of river under improvement, 25 miles; total average haul, river and ocean, 450 miles.

T T 2.

IMPROVEMENT OF ENTRANCE TO COOS BAY AND HARBOR, OREG.

Information concerning the approved project for improvement of Coos Bay and Harbor is given in the summary of this report.

OPERATIONS FOR THE FISCAL YEAR 1911.

No active operations were carried on in connection with the jetty at the entrance, completed in former years. The enrockment of the north jetty subsided slightly during the year under the action of the waves and the jetty tramway and receiving wharf have been completely destroyed by the teredo and decay, but the jetty is still effective in maintaining fairly good bar depths, averaging about 20 feet at low tide. The plant used in former years, which was badly worn by use and age, was loaded on a barge and taken to the Columbia River last summer, and the engines and such parts of it as were serviceable were repaired and put in use at The Dalles-Celilo Canal. During the present spring about 52 acres of the sands of the north spit were planted to Holland grass roots (Arunda Arenaria) which were obtained from the plantations of former years.

The river and harbor act of June 25, 1910, provided $50,000 for continuing the approved project of dredging a channel from Marshfield to deep water in the lower bay, with a least depth of 18 feet. No active dredging operations had been carried on at Coos Bay under the project since September 3, 1909, on account of the reduction of available funds, and for the reason that the dredge *Oregon* was needed in the State of Washington. The dredge was taken from Coos Bay for work in the Columbia River and at Grays Harbor, after a channel with a least width of 160 feet and a least depth of about 17 feet at mean lower low water had been excavated from the C. A. Smith Lumber Co.'s wharf, just above Marshfield, to a point opposite plat "B," above the Porter mill at North Bend. The dredging work at Grays Harbor, Wash., came to an end in October, 1910.

The dredge *Oregon* and a barge with 27 pontons and pipe line arrived at Coos Bay in tow of the tug *Daring*, two days from Grays Harbor, on October 28, 1910. As soon as possible after its arrival at Coos Bay the dredge was gotten ready and started work by hired labor on Pony Slough Shoal November 10. It worked 14 days at this place and excavated about 10,000 cubic yards of sand, but the rough water in this exposed portion of the bay at this season rendered it advisable to leave the Pony Slough Shoal and dredge farther up the bay during the winter.

On November 24, 1910, work was commenced at the lower end of the cut made in 1909, opposite plat "B" above the Porter mill, and continued down the bay in the projected channel to moderately deep water past North Bend. The work on this portion of the channel was continuous until April 16, and during this period 332,437 cubic yards of sand, mud, and oyster shells were excavated, most of which was deposited behind bulkheads built by private parties on the west shore of the bay.

On April 16 the dredge commenced on the cut through North Slough Shoal, which was completed May 5, 1911, after excavating 30,170 cubic yards of sand, which was pumped along the edge of the west shore. The dredge was then moved to Pony Slough Shoal and the cut was completed there to partial width June 3, 1911, 45,546 cubic yards of sand having been removed from the shoal at this time and a small portion pumped behind a bulkhead on the west shore, and the balance on the east shore.

During the year 25 new pontons were built at Coos Bay, by hired labor, to give a longer pipe line, and the dredge was maintained in good repair. In all, 418,150 cubic yards of material were excavated on the project at Coos Bay during the fiscal year, and this work, together with that of former years, has resulted in a channel up the bay to the C. A. Smith mill above Marshfield at least 160 feet wide, with a controlling depth of 17 feet at mean lower low water.

On June 3, 1911, the dredging work at Coos Bay was suspended, as the *Oregon* was needed at the Coquille to complete the dredging project there, while the conditions permitted of her being towed to and from that place. The dredge, together with the pontons and pipe line, was towed to the Coquille on June 8, 1911. It is thought that the dredging on the Coquille will be completed and the *Oregon* taken back to Coos Bay by September or October, 1911, and the work of completing the projected bay channel in Coos Bay will be completed during the next fiscal year.

As the present dredged cut at Coos Bay is in an unfinished condition and several changes have taken place in the channels of the bay since the last survey, a new survey of the hydrography of the upper part of the bay from the C. A. Smith mill to a point below Pony Slough, as a guide to future work, is being made and will be finished at an early date.

Progress has been made on the preparation of plans in Washington, D. C., for a seagoing hydraulic dredge for service on the bar, at a cost of $350,000, as provided for in the approved project. It will probably be more than a year before this seagoing dredge is ready for service.

In compliance with the requirements of the river and harbor act of June 25, 1910, an examination was made of Coos Bay with a view to the removal of Guano Rock. Report thereon was submitted by the district officer December 5, 1910, in which it was found that the proposed improvement was not worthy of being undertaken by the General Government.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance	[1] $70,000

APPROPRIATIONS.

Appropriated to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$938,750.00
Apr. 5, 1905 (allotted to Coos River)	3,000.00
	935,750.00
June 25, 1910	400,000.00
Feb. 27, 1911	40,000.00
Receipts from sales	455.48
	1,376,205.48

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[1] Exclusive of the balance unexpended July 1, 1911.

CONTRACTS IN FORCE.

Lease:
- Name of lessor: F. J. Bingham, Marshfield, Oreg.
- Date of lease: November 23, 1910.
- Character: Hire of scow.
- Price: $25 per month.
- Approved: Authorized by Chief of Engineers December 15, 1910.
- Date of beginning: November 23, 1910.
- Date of expiration: June 8, 1911.

Lease:
- Name of lessor: Kruse & Banks, Marshfield, Oreg.
- Date of lease: October 29, 1910.
- Character: Hire of scow.
- Price: $1 per day.
- Approved: Authorized by Chief of Engineers November 2, 1910.
- Date of beginning: October 29, 1910.
- Date of expiration: June 8, 1911.

Lease:
- Name of lessor: S. C. Rogers, North Bend, Oreg.
- Date of lease: December 14, 1910.
- Character: Hire of steamboat.
- Price: $10 per day.
- Approved: Authorized by Chief of Engineers October 10, 1910.
- Date of beginning: December 14, 1910.
- Date of expiration: April 14, 1911.

COMMERCIAL STATISTICS, 1910.

Vessel classification.

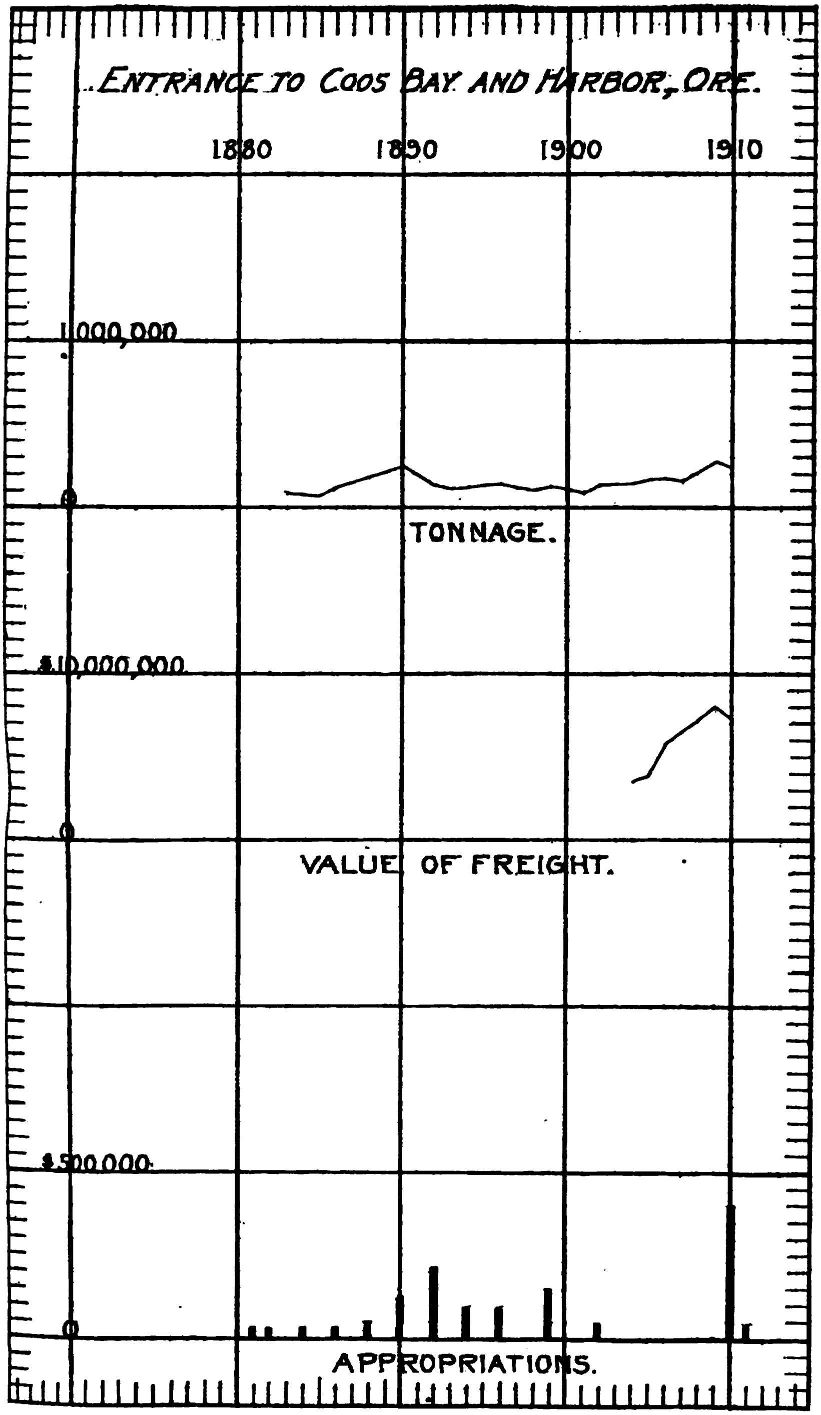
Classes.	American.	Net registered tonnage.	Passengers.
Unregistered (licensed and enrolled):			
Steamers	650	346,289	12,398
Gasoline	87	4,027	
Sailing	117	49,855	
Total	[1] 854	400,171	12,398

[1] Arrivals and clearances, irrespective of number of vessels.

Freight traffic.

Articles.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Brick	390 M	1,172	$4,688	$0.01
Cement	450 barrels	90	1,080	.0062
Coal	9,055 tons	9,055	36,220	.0037
Dairy produce	247 tons	247	33,960	.02
Fish	911 tons	911	100,210	.015
Fruit	218 tons	218	1,308	.01
Grain	45 tons	45	900	.0075
Hay	733 tons	733	10,995	.0075
Laths	123,104 M	4,232	184,656	.005
Lumber	114,313,000 feet b. m.	171,531	1,715,310	.005
Live stock	40 head	20	2,500	.0625
Machinery	643 tons	643	64,300	.0325
Miscellaneous	50,855 tons	50,855	5,085,550	.0075
Oil	6,585 barrels	1,317	3,951	.01
Shingles	2,280 bundles	38	1,140	.0127
Shooks	1,207 cords	1,810	54,300	.0299
Woolen goods	52 tons	52	26,000	.0075
Total		242,969	7,377,068	

Average haul on portion of river under improvement, 14 miles; total average haul on rivers and ocean, 400 miles.


ENTRANCE TO COOS BAY AND HARBOR, ORE.
1880
1890
1900
1910
1,000,000
0
TONNAGE.
$10,000,000
0
VALUE OF FREIGHT.
$500,000
0
APPROPRIATIONS.

T T 3.

IMPROVEMENT OF COOS RIVER, OREG.

Information concerning the project for this improvement will be found in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

The act of June 25, 1910, appropriated $3,000 for maintenance. The Government snag scow and dredge were put in order in August, 1910, and operated on Coos River by hired labor until November 21, 1910, removing all troublesome snags from the head of navigation on both forks to the mouth.

During the season 228 large and 330 small snags were removed and placed on the banks. In addition to the snagging the dredge bucket was rigged and 2,200 cubic yards removed from Island Shoal on the South Fork, and the channel of the North Fork was dredged below Allegany for about 600 feet downstream.

Active operations ceased on November 21, leaving the river in excellent condition. The total cost of this work was $3,217.75.

It is estimated that an appropriation of $3,000 will be necessary for maintenance during the fiscal year 1913.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $3,000

APPROPRIATIONS.

Total appropriated to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$10,000
Apr. 5, 1905 (allotted from "Improvement of Coos Bay and Harbor, general improvement")	3,000
Mar. 2, 1907	3,000
June 25, 1910	3,000
Total	19,000

COMMERCIAL STATISTICS, 1910.

Vessel classification.

Classes.	American.	Net registered tonnage.	Passengers.
Unregistered (licensed and enrolled):			
Steamers	3	237	29,714
Gasoline	6	55	
Total	[2] 9	292	29,714

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[1] Exclusive of the balance unexpended July 1, 1911.
[2] Number of vessels plying river.

Freight traffic.

Articles.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	648 tons	648	$2,592.00	$0.015
Dairy produce	2,743 tons	2,743	932,620.00	.02
Fruit	387 tons	387	2,922.00	.02
Fish	32 tons	32	3,840.00	.02
Eggs	284 cases	8.5	1,700.00	.04
Chittim bark	14.5 tons	14.5	1,450.00	.03
Cordwood	32 cords	48	96.00	.01
Grain	380 tons	380	7,600.00	.02
Hay	765.5 tons	765.5	11,482.50	.02
Lumber	5,882,600 feet b. m	11,984	119,840.00	.02
Logs	12,253,410 feet b. m	18,880	56,640.00	.005
Live stock	1,064 head	532	66,500.00	.07
Machinery	217.5 tons	217.5	21,750.00	.05
Miscellaneous	2,652 tons	2,652	265,200.00	.02
Piles	85 linear feet	1.5	7.50	.005
Vegetables	579 tons	579	23,160.00	.02
Rock	750 tons	750	1,125.00	.01
Woolen goods	19.5 tons	19.5	9,750.00	.02
Spars	440 linear feet	8	68.00	.02
Total		40,150	1,528,343.00	

Average haul on portion of river under improvement, 7 miles; total average haul, 7 miles.

T T 4.

IMPROVEMENT OF SIUSLAW RIVER AT THE MOUTH.

For information concerning future work on and the status of this improvement, attention is invited to the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

No work has been carried on during the year by the General Government, as no funds were available until the passage of the act of June 25, 1910. The port of Siuslaw, a municipal corporation, was authorized by the Secretary of War, under date of July 23, 1908, to assist in the construction of the jetties, and operations began early in February, 1911, under a fund of $100,000, which was realized by the port district through sale of bonds. A contract was made with Robert Wakefield under date of December 24, 1909, for extending the south jetty in accordance with the latest approved project, and under specifications approved by the district officer. Part of the old Government plant belonging to Coquille River was loaned for use on this work. The improvement work under this contract, which was commenced in February, 1910, was carried on from July 1, 1910, to December 18, 1910, inclusive, and from February 6, 1911, to June 18, 1911, inclusive, on which latter date the contract was completed.

The jetty tramway was extended seaward a distance of 1,935 feet during the year. The sea end is 2,940 feet distant from the receiving wharf. The enrockment has been completed throughout the entire length to a height of about 10 feet above low water. A brush foundation mattress was used from bent 65 to bent 125, a distance of 900 feet, where its use was discontinued and the smaller size stone used instead for the foundation course.

The following materials have been placed in the work by the contractor during the fiscal year:

Classifications.	Quantity.	Price.	Amount.
Piles..........linear feet..	21,366	$0.25	$5,341.50
Lumber..........feet b. m..	175,612	25.00	4,390.30
Drift bolts..........pounds..	9,447	.06	566.82
Wire of ship spikes..........do....	1,000	.08	80.00
Old rails, relaid..........tons..	44.8	10.00	448.00
Railroad spikes..........pounds..	3,100	.06	186.00
Fishplates..........pairs..	350	.96	336.00
Bolts and nuts for fishplates..........do....	450	.06	27.00
Mattresses..........cords..	397	6.00	2,382.00
Stone..........tons..	63,437	1.05	66,608.85
Total..........	....	....	80,366.47

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance..........	[1] $120,500

APPROPRIATIONS.

Appropriated prior to adoption of present project (see H. Doc. No. 421, 57th Cong., 2d sess.)..........	$187,000.00
June 30, 1908, carried to surplus fund..........	24,838.00
	162,162.00
Received from sales..........	150.10
June 25, 1910..........	50,000.00
Mar. 4, 1911, sundry civil act..........	50,000.00
Total..........	262,312.10

T T 5.

IMPROVEMENT OF TILLAMOOK BAY AND BAR, OREG.

Information concerning the status of this work will be found in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

At the close of last fiscal year there were no Government funds available for carrying on active operations. The port of Tillamook, however, under authority granted it the latter part of May, 1910, continued the operation of the dredge without expense to the United States, and in July 13,008 cubic yards were excavated from the projected channel in the vicinity of the Bay City Cut. On August 1 the appropriation of $5,000 by act of June 25, 1910, became available, and active operations were in progress by hired labor, with the Government plant, from August 1 to November 30, 1910, restoring the channels in the bay to the projected depth, by redredging between Bay City Cut and a point below Memaloose Point.

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[1] Exclusive of the balance unexpended July 1, 1911.

During these four months about 40,510 cubic yards of material, composed of sand and silt, were excavated and removed to about 150 feet from the channel by sluiceways.

The available funds again becoming nearly exhausted by the end of November, the port of Tillamook was granted authority to continue dredging operations. Under this arrangement the Government plant was operated continuously until April 1, 1911, redredging and restoring the channel between Dicks Point and Memaloose Point, and in Hoquarten Slough to near the town of Tillamook. In these four months 36,903 cubic yards of sand and silt were removed and either sluiced to the side of the channel or placed on the adjacent banks of Hoquarten Slough. In addition, 175 snags were removed from the channel.

The $5,000 appropriated by act of February 27, 1911, becoming available, the plant was operated by hired labor from April 1 to May 15, redredging the channel in Hoquarten Slough to the town of Tillamook. During this period about 14,000 cubic yards of mud were excavated and placed on the banks, and 45 snags were removed. The total amount expended from Federal funds for dredging operations was $4,651.45.

The condition of the dredge, which is over 10 years old, was such that it was found necessary to suspend work and repair it by the renewal of decayed timbers and planks, recalking, including the bottom, etc., and on May 15 the work of dredging was suspended and the repair work commenced by hired labor.

Dredging operations were carried on continuously during about 11 months of the year, and resulted in maintaining the projected depth of 9 feet at ordinary high water in the channel between Bay City and Tillamook. The freshets during the spring months carried a great deal of deposit into the channel below Dicks Point, and it is not thought that the funds on hand will be sufficient to maintain the project throughout the coming year.

The river and harbor act of June 25, 1910, provided for preliminary examination of Tillamook Bay and Bar, Oreg., by a board of engineer officers, with a view to securing a channel depth of 15 to 20 feet, respectively, with a report on any proposition for cooperation by the localities affected thereby. As a result of the examination, a plan and estimate of cost of improvement of the locality was authorized and was submitted on December 30, 1910.

It will require more than $5,000 annually for the maintenance of the existing project with the present Government plant.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement.. [1]$5,000

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[1] Exclusive of the balance unexpended July 1, 1911.

APPROPRIATIONS.

Appropriated to Dec. 31, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$105,700
Mar. 3, 1905	10,000
Mar. 2, 1907	10,000
Mar. 3, 1909 (allotted Mar. 27, 1909, Apr. 20, 1909, May 4, 1910)	6,500
June 25, 1910	5,000
Feb. 27, 1911	5,000
Receipts from sales	20
Total	[1] 142,220

COMMERCIAL STATISTICS, 1910.

Vessel classification.

Classes.	American.	Net registered tonnage.	Passengers.
Unregistered (licensed and enrolled):			
Steamers	178	27,014	2,431
Gasoline	56	6,365	
Sailing	2	510	
Unrigged	4	600	
Total	[a] 240	34,489	2,431

[a] Arrivals and clearances irrespective of number of vessels.

Freight traffic.

Articles.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	100 tons	100	$500	$0.0277
Dairy produce	1,207 tons	1,207	410,380	.0277
Fish	260 tons	260	31,200	.0277
Lumber	60,000 feet b. m.	90	900	.0683
Miscellaneous	20,241 tons	20,241	2,024,100	.0277
Total		21,898	2,467,080	

Average haul on portion of river under improvement, 12 miles; total average haul, rivers and ocean, for all articles except lumber, 180 miles; total average haul, rivers and ocean, for lumber, 620 miles.

T T 6.

IMPROVEMENT OF THE SNAKE RIVER, OREG., WASH., AND IDAHO.

Information concerning the details of this project, with the status of this improvement, is given in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

This work is carried on by hired labor and use of Government plant, dredge *Wallowa* and steamer *Umatilla*, and drill scow *No. 2*, constructed with State funds.

The work was concentrated principally on the river below Riparia. Inspection of the river between Riparia and Lewiston showed that the channels had maintained their depths. Above Lewiston work was done at Slaughterhouse Bar, just below Asotin, and at Captain John, Fishers, and Couse Creek Rapids.

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[1] Of this amount $200.14 was returned to the Treasury.

The steamer *Umatilla* worked one-half month in July, 1910, at Five Mile Rapids, building a wing dam to shut off the south side channel, and was then taken from this work to the Columbia River and was not returned to the Snake until the middle of March, 1911, when, in conjunction with drill scow *No. 2* and dredge *Wallowa*, the dam at Long Crossing bar was finished. This dam was commenced in 1909, but was not completed, and was beaten down by the ice floes during the past two winters. The dam is 600 feet long, 7 feet above low water, and was constructed to narrow the channel, which is very wide at this place, and to concentrate the flow of water, to maintain a deeper channel across the bar, which is now the shoalest on the river below Lewiston, Idaho.

The dredge *Wallowa* began work July 1, 1910, at Palouse Rapids, 8 miles below Riparia. The channel was widened from 65 feet to 85 and 90 feet at the lower end of the rapids, and at the upper end a sharp bend in the channel was straightened out. Owing to a rise in the river in November the dredge was taken above Lewiston where work was done at Fishers, Couse Creek Bar, and Captain John Rapids, raking the gravel bars and blasting large bowlders to lessen the current over the bars where it is necessary for upstream boats to use a line.

The dike at Slaughterhouse Bar, just above Lewiston, was repaired and extended. This work was finished in January, 1911, and the dredge moved to the Columbia River, returning the middle of March for work on the dam at Long Crossing Bar, which was continued until April 30, when all field work was suspended and plant laid up until after the high-water season.

Drill scow *No. 2* began work July 1, 1910, at the head of Pine Tree Rapids and continued work there until December, widening and straightening the channel to remove cross currents. The channel is much improved, but considerable work remains to make it safe for low-water navigation. The scow was removed to the Columbia River February 1, 1911, and returned to the Snake about the middle of March to assist in building dam at Long Crossing Bar.

Following is a summary of work done during the past season:

Localities.	Rock blasted.	Drags with channel rake.	Rock placed in dams.
	Cubic yards.		*Tons.*
Fishers Rapids	196	155	
Captain John Rapids	175	100	
Couse Creek Bar	188	50	
Slaughterhouse Rapid			1,160
Palouse Rapids	2,527		
Rapid No. 4	65		
Pine Tree Rapid	1,048		
Long Crossing Bar			2,959
Fish Hook Rapids			255
Fivemile Rapids			140
Total	4,198	305	4,514

The volume of water being sufficient, it is believed that a good low-water channel can be secured between Riparia and the mouth by continuing to blast out obstructions. The funds appropriated by act of June 25, 1910, were nearly exhausted when the plant was laid up owing to high water, but operations will again be resumed on funds made available by act of February 27, 1911, as soon as the river recedes to a favorable stage.

On June 5, 1911, the open-river steamer *Twin Cities* left Lewiston at 1 a. m. with an excursion party, which was transferred to the steamer *Bailey Gatzert* by the State Portage Railway and reached Portland at 10 p. m. of the same day. So far as known this is the only instance of a one day's water trip from Lewiston to Portland, a distance by river of 390 miles.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance	[1] $30,000

APPROPRIATIONS.

Total appropriated to June 13, 1902, including $12,294.41 transferred by act of that date from appropriation for improving Clearwater River, Idaho (see H. Doc. No. 421, 57th Cong., 2d sess.)	$226,544.41
Mar. 3, 1905	25,000.00
Mar. 2, 1907	10,000.00
Appropriated by State of Washington	100,000.00
Mar. 3, 1909 (allotted Mar. 30, 1909, and Oct. 7, 1909)	15,000.00
June 25, 1910	25,000.00
Feb. 27, 1911	15,000.00
Receipts from sales	825.70
	417,370.11
Reverted to Washington State treasury	15,000.00
Total	[2] 402,370.11

COMMERCIAL STATISTICS, 1910.

Vessel classification.

American unregistered, licensed, and enrolled river steamers	[3] 7
Net registered tonnage	2,598
Passengers	587

Freight traffic.

Classes.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Wheat	740,100 bushels	22,203	$555,075	$0.009
Other cereals	3,040 tons	3,040	60,800	.009
Flour	1,160 barrels	116	6,960	.0083
General merchandise	2,524 tons	2,524	252,400	.0302
Cattle and horses	100 head	50	6,250	.04
Cement and lime	200 barrels	40	480	.0122
Miscellaneous	90 tons	90	5,400	.0302
Total		28,073	887,365	

Average haul on portion of river under improvement, 80 miles; total average haul on rivers, 215 miles.

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[1] Exclusive of the balance unexpended July 1, 1911.
[2] Of this amount $601.41 was returned to the Treasury.
[3] Number of vessels plying river.

T T 7.

IMPROVEMENT OF THE COLUMBIA RIVER AND TRIBUTARIES ABOVE CELILO FALLS TO THE MOUTH OF THE SNAKE RIVER, OREG. AND WASH.

Information concerning this project, with the status of the improvement, is given in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

This work being in close connection with the Snake River improvement, the plant is used on either work to the best advantage of the locality. The work was carried on by steamer *Umatilla* and dredge *Wallowa*, built by Federal funds, and drill scows *Nos. 1, 2*, and *3*, built in 1907, by funds appropriated by the State of Washington.

Steamer *Umatilla* began work at Homly Rapids July 10, 1910, removing rock and building wing dams to concentrate the flow of water over the shoal gravel bar, and was removed to Devils Bend Rapids September 20, where drilling and blasting on the numerous reefs and bowlders was commenced. This work was completed, after several interruptions by rising river and ice, in the middle of January, 1911, and the steamer moved to Squally Hook Rapids.

The work accomplished at Devils Bend consisted of the removal of six large reefs and several bowlders, to a depth of 5 feet at extreme low water, making a comparatively straight channel through the rapids 100 feet in width. It is believed this channel will be sufficient for navigation for some time to come.

Drilling and blasting was carried on at Squally Hook Rapids until the middle of March, when high water stopped operations and the steamer taken to Snake River for work there. The *Umatilla* was also used to make trips of inspection, for towing scows into position for work, and for raking blasted rock from channels at Umatilla, Homly, and Devils Bend Rapids.

The self-propelling dredge *Wallowa* was brought from Snake River February 1, 1911, and worked at John Day Rapids until the middle of March, when the rising river stopped drilling and blasting operations. The shoalest part of John Day rock was removed to a depth of 5½ feet at low water, and it is believed that additional work on this rock will not be necessary until other rapids are further improved.

Drill scow *No. 1* worked the entire season at upper Umatilla Rapids, drilling and blasting the reefs to widen and straighten the channel, until high water in March stopped operations. This channel will require considerable more work to entirely clear it of obstructions.

Drill scow *No. 2* was moved from Snake River about February 1 to Canoe Encampment Rapids on the Columbia River. Several reefs were removed, but the channel was not cleared of such obstructions before the rising river in March compelled suspension of operations.

Drill scow *No. 3*, wrecked by ice jam on Snake River in 1909, was hauled out in September and repaired, and new equipment purchased. It began work in October at Homly Rapids, blasting the numerous bowlders on the gravel bar. About 185 bowlders have been removed to a depth of 4½ to 6 feet at low water. Operations were suspended in March, owing to high water, and the scow laid up.

The channel at Homly Rapids now has a depth of about 4½ feet at low water to a width of about 100 feet, where formerly it was impassable at a low-water stage for boats of any size. It is thought another season's work will make the channel ample for present demands of navigation.

The past season has been favorable for the progress of the work. The river was low early in September and remained at a low stage until the middle of March. In November and December small freshets interfered somewhat with the work. In January, about one week's work was lost on account of floating ice. The river reached its lowest stage in February, the Umatilla gauge then reading 0.3 above zero, which is the lowest recorded for several years.

Following is a summary of the work done at each locality:

Rapids.	Rock blasted.	Drags made with channel rake.	Rock placed on dams.
	Cubic yards.		*Tons.*
Homly	605	498	959
Umatilla	1,592	347	....
Devils Bend	424	10	....
Canoe Encampment	63	....	....
Squally Hook	891	310	....
John Day	413	170	....
Total	3,988	1,335	959

Total expenditures for the above work was $49,522.41.

With the unexpended balance from amount appropriated by act of June 25, 1910, and the $25,000 appropriated by act of February 27, 1911, it is believed that the channel can be greatly improved during the next fiscal year.

Preparations are now in progress for resumption of operations as soon as the river falls to a favorable stage.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $30,000

APPROPRIATIONS.

Appropriated prior to adoption of present project	$120,000
Mar. 2, 1907	120,000
Appropriated by State of Washington	25,000
June 25, 1910	90,000
Feb. 27, 1911	25,000
Total	380,000

COMMERCIAL STATISTICS, 1910.

Vessel classification.

American, unregistered, licensed, and enrolled river steamers	[2] 6
Net registered tonnage	1,946
Passengers	900

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[1] Exclusive of the balance unexpended July 1, 1911.
[2] Number of vessels plying the river.

Freight traffic.

Articles.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Wheat	93,334 bushels	2,800	$70,000	$0.009
Other cereals	300 tons	300	6,000	.009
Flour	1,000 barrels	100	6,000	.0063
Machinery	25 tons	25	2,500	.0247
Hay	50 tons	50	750	.009
General merchandise	4,515 tons	4,515	451,500	.0247
Cattle and horses	175 head	88	11,000	.04
Cement and lime	100 barrels	25	300	.01
Stone	5,465 tons	5,465	8,197	.01
Lumber	8,000 feet b. m	12	120	.029
Railroad iron, etc	150 tons	150	6,000	.029
Total		13,530	562,367	

Average haul on portion of river under improvement, 123 miles; total average haul on river, 200 miles.

T T 8.

IMPROVEMENT OF COLUMBIA RIVER BETWEEN THE FOOT OF THE DALLES RAPIDS AND THE HEAD OF CELILO FALLS, OREG. AND WASH.

Information regarding the details of this work and the status of the project will be found in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

Operations in connection with the construction of the canal were continued under contract with Messrs. Caughren, Winters, Smith & Co., dated September 18, 1908, to complete about 14,000 feet of canal (from stations 283 to 427 of canal center line), except the concrete lining of the canal section, in permeable material. Active operations were carried on throughout the year, except when interrupted by high water.

The following is a detailed statement of the work performed by them during the fiscal year:

Classifications.	Quantity.	Price.	Amount.
Solid rock excavation .... cubic yards	157,192.43	$0.90	$141,473.19
Sand excavation .... do	38,727.31	.20	7,745.46
Common excavation .... do	3,216.87	.28	900.72
Clearing excavation .... acres	.40	25.00	10.00
Overhaul excavation .... cubic yards per M feet	93,756.90	.10	9,375.69
Concrete .... cubic yards	14,760.72	7.50	110,705.40
Rubble masonry .... do	1,121.86	6.00	6,731.16
Bolts and anchor holes .... linear feet	936.75	1.00	936.75
Wrought iron .... pounds	156.50	.06	9.39
Reenforcing rods, steel .... do	8,063.25	.06	483.80
Drain tile .... linear feet	178.00	.50	89.00
Labor, force account			3,119.66
Total			281,580.22

Contractors finished all work under their contract on May 1, 1911, and the progress since the beginning is shown by the following table:

Classifications.	Estimated quantities.	Work done fiscal year—			Total to May 1, 1911, final estimate.
		1908-9	1909-10	1910-11	
Solid rock excavation..........cubic yards..	320,000	99,068	103,759	157,192.43	360,019.43
Sand excavation......................do....	165,000	238,219	63,315	38,727.31	340,261.31
Common excavation..................do....	165,000	158,020	15,717	3,216.87	176,953.87
Clearing.................................acres..	5	5	....	.4	5.40
Overhaul.........................per M feet..	400,000	130,000	268,307	93,756.90	492,063.90
Concrete......................cubic yards..	13,000	....	47	14,760.72	14,807.72
Rubble masonry.....................do....	4,000	....	....	1,121.86	1,121.86
Bolts and anchor holes...........linear feet..	1,000	....	....	936.75	936.75
Cast iron...........................pounds..	2,000	....	....	....	....
Wrought iron.........................do....	1,000	....	....	156.50	156.50
Reenforcing rods.....................do....	2,000	....	....	8,063.25	8,063.25
Drain tile........................linear feet..	1,000	....	....	178.00	178.00
Labor, force account..............................	....	....	8,462.81	3,119.66	11,582.47

Contractor Robert Wakefield, under contract dated October 14, 1909, for removing rock from submerged reefs and main shore of Columbia River near the canal entrance at Big Eddy, resumed work on September 13, 1910, and on account of an unfavorable season was unable to complete his contract and suspended work for the season April 26, 1911, on account of high water. The contract period expired May 1, 1911, but an extension of time was granted for a reasonable period. On account of the small amount of work yet to be done it is expected that the contractor will have no difficulty in completing the work during the next low-water season.

The following table shows the progress of the work:

Classifications.	Unit price.	Estimated quantities.	1909-10	1910-11	Total to June 30, 1911.
		Cubic yards.	*Cubic yards.*	*Cubic yards.*	*Cubic yards.*
Class A, solid rock excavation..............	$2.00	6,000	1,839	3,783	5,622
Class B, solid rock excavation..............	4.00	7,600	....	4,333	4,333

HIRED LABOR WORK.

Under authority of the Chief of Engineers, dated June 7, 1910, work has been carried on by hired labor at various points along the canal line between stations 0 and 376 of canal center line. The work was begun at west end of canal on a small scale and gradually extended eastward, being so arranged as to facilitate simultaneous completion of all parts of the work and to minimize interference with work by freshets of Columbia River.

The past year has been devoted largely to the preliminary work of construction of camp, shop, and storehouse buildings, and purchase, assembly, and erection of plant, with result that although expenses for the year have been heavy the work is now well organized and equipped to obtain good results, and leave with very little additional expense, other than that already incurred, all dwellings, storehouses, shops, and plant necessary for the maintenance and operation of the completed canal. There are now complete three well-equipped camps suitably located along the line of work, and heavy plant is on the ground as follows: 4 steam shovels, 1 land dredge, 15 locomotives, 83 4-yard dump cars, 36 small dump cars, 1 rock-crushing plant (complete), 1 sand-grinding plant, 2 concrete-mixing plants, 2 air-compressor plants, about 30 steam and air drills, 9 derricks (complete with engines and boilers), 1 electric lighting plant, 2 deep wells (with pumping plants complete), 31 horses (with wagons and scraper outfits), extra boilers for steam drills, and a complete machine, carpenter, and blacksmith shop sufficient for maintaining the above plant in good condition.

The construction work done by the hired labor force during the past fiscal year, in addition to building and care of camps, installation and repair of plant, etc., is as follows, most of said work having been done the latter half of the year:

Solid rock excavation:		
Lock excavation	cubic yards	65,139
Canal trunk	do	141,738
		206,877
Sand and common excavation	do	228,803
Overhaul (cubic yards hauled 1,000 feet)	do	102,250
Concrete	do	6,048
Rubble masonry	do	1,276
Anchor holes drilled	linear feet	913
6 by 8 foot tunnel for filling culverts	do	59

The total expenditures for the fiscal year in connection with hired labor work, including plant, buildings, general supplies, labor, superintendence, etc., were $648,490.81. It is proposed to expend the available funds in further construction by hired labor and purchase of materials, this method being believed to be the most advantageous on account of greater flexibility.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $750,000

APPROPRIATIONS.

Appropriated prior to adoption of present project (see H. Doc. No. 421, 57th Cong., 2d sess.)	$350,000.00
Mar. 3, 1905	50,000.00
June 30, 1906	250,000.00
Mar. 2, 1907	100,000.00
May 27, 1908	336,000.00
Mar. 4, 1909	164,000.00
June 25, 1910	600,000.00
Feb. 27, 1911	600,000.00
Receipts from sales	70.93
Total	2,450,070.93

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[1] Exclusive of the balance unexpended July 1, 1911.

CONTRACTS IN FORCE.

Formal:
  Name of contractor: Caughren, Winters, Smith & Co., Spokane, Wash.
  Date of contract: September 18, 1908.
  Character: Constructing portion of Dalles-Celilo Canal.
  Approximate quantities (in place) with prices:
    320,000 cubic yards solid rock excavation, at 90 cents per cubic yard.
    165,000 cubic yards sand excavation, at 20 cents per cubic yard.
    165,000 cubic yards common excavation, at 28 cents per cubic yard.
    13,000 cubic yards concrete, at $7.50 per cubic yard.
    4,000 cubic yards rubble masonry, at $6 per cubic yard.
    1,000 linear feet bolt and anchor holes, at $1 per linear foot.
    2,000 pounds cast iron, at 5 cents per pound.
    1,000 pounds wrought iron, at 6 cents per pound.
    2,000 pounds reenforcing rods, at 6 cents per pound.
    1,000 linear feet drain tile, at 50 cents per linear foot.
    5 acres clearing, at $25 per acre.
    400,000 cubic yards overhaul, per 1,000 feet, at 10 cents per cubic yard.
  Approved: November 9, 1908.
  Date of beginning: 30 days after date of notification of approval of contract.
  Date of expiration: May 1, 1911.

Formal:
  Name of contractor: Robert Wakefield, Portland, Oreg.
  Date of contract: October 14, 1909.
  Character: Removing rock from Columbia River near Big Eddy.
  Approximate quantities with prices:
    6,000 cubic yards class A rock, at $2 per cubic yard.
    7,600 cubic yards class B rock, at $4 per cubic yard.
  Approved: October 23, 1909.
  Date of beginning: 30 days after notification of approval of contract.
  Date of expiration: 18 months after notification of approval of contract.
  Extension of time granted for a reasonable period.

Lease:
  Name of lessor: Lewis Investment Co., Portland, Oreg.
  Date of lease: November 1, 1910.
  Character: Hire and lease of 9 rooms.
  Price: $195 per month.
  Approved: Authorized by Chief of Engineers, October 24, 1910.
  Date of beginning: November 1, 1910.
  Date of expiration: June 30, 1911.
  Renewal: July 1, 1911.
  Date of expiration: June 30, 1912.

COMMERCIAL STATISTICS, 1910.

Vessel classification.

American, unregistered, licensed, and enrolled river steamers	[1] 5
Net registered tonnage	1,561
Passengers	43

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[1] Number of vessels working in connection with Oregon State Portage.

Freight traffic handled by Oregon State Portage Ry. between Big Eddy and Celilo, Oreg.

Articles.	Amount in customary units.	Amount in short tons.	Valuation.	Rate per ton-mile.
Barley and oats	6,720 bushels	168	$3,360	$0.0277
Cement	11,040 barrels	2,208	25,392	.0277
Coal	6,525 tons	6,525	32,625	.044
General merchandise	6,548 tons	6,548	654,800	.0555
Hay	400 tons	400	6,000	.0277
Live stock	147 head	74	9,350	.222
Lumber	1,877,079 feet b. m.	2,819	28,190	.0555
Machinery	3,360 tons	3,360	336,000	.0555
Miscellaneous	6 tons	6	360	.0555
Railroad iron	850 tons	850	29,750	.0555
Powder	264 tons	264	92,400	.1111
Sand and gravel	312,000 cubic yards	20,800	20,800	.0277
Wheat	96,100 bushels	2,883	129,735	.0277
Piling	12,000 linear feet	550	12,000	.012
Flour	48 tons	48	2,208	.044
Total		47,503	1,382,970	

Average haul, length of Portage railway, 9 miles.

The State Portage road was extended to The Dalles, Oreg., and since about April 8, 1911, The Dalles was made the western terminus of the railway.

T T 9.

CANAL AT THE CASCADES, COLUMBIA RIVER, OREG.

Information concerning this project and the status of the improvement will be found in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

The status of this improvement remains practically as reported for several years past, as no funds have been available for finishing the incompleted items of the approved project. No construction work was carried on during the year, all expenditures having been on account of maintenance.

The completion of the land wall on the south side of the upper lock is the most important of these items and should be undertaken at an early date. This wall would replace a sloping bank of earth, and by restricting the capacity of the lock to its contemplated dimensions shorten the time required for lockage. It would also stop the seepage of the water through the bank from the upper to the lower lock, and the cut-off wall at the middle gates, which occurs at high water, and which is becoming more pronounced, and may become serious. The estimated cost of the south wall is $100,000.

The act of June 25, 1910, appropriated the sum of $5,000 for the removal of obstructions in the rapids immediately below the locks.

There were several dangerous submerged rocks in this part of the river and many large bowlders and projecting points of reefs and old fish leads on the banks between high and low water marks, making it dangerous for ascending steamboats, which hug the shore in high water to escape the swift current.

This work was undertaken by hired labor with a small crew and steamboat, about February 1, 1911, when the river was at a stage about 2 feet above low water. The work closed March 18, 1911, on account of a rising river. On the Washington side of the river, between the Summit and Sheridans Point, several old fish leads were removed, and 170 bowlders lying below high-water mark were broken up. On the opposite (Oregon) shore the bank below high-water mark was smoothed down by blasting bowlders and points of reefs for a distance of a quarter of a mile.

Four dangerous submerged rocks in the channel near Middle Landing, on which the depth at low water varied from 4 to 5 feet, were removed by blasting. The banks are now in good condition, but several dangerous submerged rocks and reefs remain to be removed, which can only be done to advantage with a suitable steamboat at a low stage of the river. This opportunity will not occur until low water next season.

Total cost of the above-mentioned work was $2,228.18.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $100,000

APPROPRIATIONS.

Appropriated prior to adoption of the modified project of 1894 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$3,443,403.00
June 3, 1896	50,000.00
June 11, 1896	179,597.00
Mar. 3, 1899	75,000.00
June 13, 1902	30,000.00
Mar. 3, 1905	30,000.00
Mar. 3, 1905 (allotted)	1,000.00
June 25, 1910	5,000.00
Receipts from sales	11,629.48
Total	3,825,629.48

T T 10.

OPERATING AND CARE OF CANAL AND LOCKS AT THE CASCADES OF THE COLUMBIA RIVER, OREG.

The canal and locks around the Cascades of the Columbia River are about 150 miles above the mouth of the latter in the Pacific Ocean, and, though not wholly finished, are able to pass steamboats drawing 8 feet of water. They were formally opened to navigation on November 5, 1896.

OPERATIONS DURING THE FISCAL YEAR 1911.

The locks have been available for the passage of boats every day during the fiscal year.

In addition to the usual work of care and maintenance of locks, grounds, pipe line, and machinery, the canal entrances were dredged to clear them of silt deposited by the summer freshet of 1910. This work was done by hired labor with the Government dredging plant consisting of a 1-yard orange peel bucket dredge and two bottom dump scows.

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[1] Exclusive of the balance unexpended July 1, 1911.

Dredging operations commenced August 30 and ceased early in December, 1910. During the season the dredge worked 65 days and removed 34,160 cubic yards of deposit, mostly from the upper entrance to the canal, at a total cost of $5,308.61, unit cost 15.5 cents per cubic yard. The dredged material was dumped into the river above the rapids and carried away by the current.

In addition to the dredging, the silt deposited on the top of the walls of the lower entrance was removed by hand.

During the season the dredge was rented to the Wind River Lumber Co. 13½ days to remove deposit in front of its log incline, under authority granted by the department July 26, 1910, no other dredge being available for hire in this locality.

The work of cleaning and painting the steel lock gates was carried on intermittently whenever the conditions of weather and river permitted, from August, 1910, to May, 1911. The exposed parts of the gates were first cleaned with a sand blast and then given two coats of paint. The painting of the upper guard gates was finished in November, 1910, and the apparatus removed to the lower lock gates. The work of painting these gates was suspended on April 30 on account of high water. Eighteen thousand six hundred and seventy-six square feet of surface was cleaned and painted during the fiscal year.

The four dwellings used for quarters by the lock attendants were given two coats of paint outside, and the walls of three of them kalsomined. The machine shop, barn, and waiting room were also painted outside.

The turbine and 12-inch centrifugal pump, pipes, and connections were removed, cleaned, and painted. The maneuvering machinery was overhauled and repaired. Four new gate cables were installed.

The proposed installation of an electric light plant at the locks was abandoned, it being the intention when it becomes expedient to install electric lighting by placing the fixtures in the various buildings and purchasing current from the local company which supplies light to the town.

A summary of expenditures made in operating and caring for Cascades Canal, Oreg., during the fiscal year ending June 30, 1911, submitted in compliance with river and harbor act of July 5, 1884, as amended and reenacted by section 6 of the river and harbor act of March 3, 1909, follows:

Office expenses, superintendence, and contingencies	$9,288.09
Labor (operating and maintenance)	3,769.53
Materials for repairs, etc	344.54
Tools, oil, fuel, etc	605.57
	14,007.73

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $14,200.00

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[1] Exclusive of the balance unexpended July 1, 1911.

ALLOTMENTS.

Total allotments to July 12, 1902	$44,132.17
July 8, 1903	5,000.00
June 24, 1904	7,100.00
May 24, 1905	3,000.00
July 3, 1905	18,500.00
July 10, 1906	14,150.00
July 6, 1907	7,250.00
Oct. 30, 1907	$1,500.00
July 1, 1908	14,000.00
July 17, 1908	11,000.00
July 19, 1909	4,208.54
July 27, 1910	15,072.39
Total	144,913.10

COMMERCIAL STATISTICS.

Summary of vessels locked through the canal.

Class.	Passages.	Lockages.	Registered tonnage.	Passengers.	Delays to vessels.		
					Number.	Hours.	Minutes.
American licensed and enrolled river steamers	1,154	1,110	438,919	96,810	1	1	45

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Wheat	101,585 bushels	3,048	$91,440	$0.012
Flour	3,196 bushels	320	16,000	.012
Miscellaneous grain	691 tons	691	13,820	.012
Hay	293 tons	293	5,860	.012
Cattle	436 head	219	10,950	.025
Horses	5,643 head	3,527	395,010	.025
Sheep	8,100 head	405	32,400	.075
Miscellaneous live stock	158 head	16	2,844	.075
Berries and fruit	3,133,274 pounds	1,567	94,020	.018
Lumber	185,929 feet b. m.	278	2,780	.018
Miscellaneous	26,969 tons	26,969	1,618,140	.03
Powder	65 tons	65	975	.05
Fish	23 tons	23	2,760	.025
Wool	1,283,650 pounds	642	256,800	.04
Total		38,063	2,543,799	

Average haul on portion of river under improvement, 4 miles; maximum haul on rivers, 388 miles; total average haul on rivers, 200 miles.

T T II.

IMPROVEMENT OF THE COLUMBIA RIVER BETWEEN VANCOUVER, WASH., AND THE MOUTH OF WILLAMETTE RIVER.

Information concerning the details of this work, with status of improvement, will be found in the summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

In September a survey was made from the railroad bridge at Vancouver to the mouth of the Willamette River. This survey showed very little change from the previous year. The shoal abreast Hayden

Island carried about the same depth of water, and the channel next to the island had a ruling depth of about 9 feet at low water.

The channel crossing over from Hayden Island to the Washington shore showed no improvement. It carried a ruling depth of about 11 feet at low water.

The dike at the head of Oregon Slough has remained intact and requires no repairs at this time.

The district officer is of opinion that maintenance work that can not be done without the construction of additional plant is not worthy of execution by the General Government until such time as dredging plant may be necessary on channels leading to Portland, Oreg. This opinion was expressed in a report of an examination authorized by the river and harbor act of March 3, 1909, and made in April, 1910, and published as House Document No. 42, Sixty-second Congress, first session.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1]$3,000

APPROPRIATIONS.

Total appropriations to 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$110,000
Mar. 3, 1905	30,000
June 30, 1906	13,000
Mar. 3, 1909 (allotted Mar. 30, 1909)	5,000
June 25, 1910	10,000
Feb. 27, 1911	3,000
Total	171,000

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[1] Exclusive of the balance unexpended July 1, 1911.

APPENDIX U U.

IMPROVEMENT OF RIVERS AND HARBORS IN THE SECOND PORTLAND, OREG., DISTRICT.

REPORT OF MAJ. J. F. McINDOE, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Willamette River, above Portland, Yamhill and Long Tom Rivers, Oreg.
2. Operating and care of lock and dam in Yamhill River, Oreg.
3. Willamette River at Willamette Falls, Oreg.
4. Columbia and lower Willamette Rivers below Portland, Oreg.
5. Mouth of Columbia River, Oreg. and Wash.
6. Clatskanie River, Oreg.
7. Cowlitz and Lewis Rivers, Wash.
8. Grays River, Wash.
9. Gauging waters of Columbia River, Oreg. and Wash.

United States Engineer Office,
Portland, Oreg., July 15, 1911.

Sir: I have the honor to transmit herewith annual report for the fiscal year ending June 30, 1911, pertaining to improvement of rivers and harbors in the second Portland, Oreg., district.

* * * * * * *

Very respectfully,

J. F. McIndoe,
Major, Corps of Engineers.

The Chief of Engineers United States Army.

U U 1.

IMPROVEMENT OF WILLAMETTE RIVER, ABOVE PORTLAND, AND YAMHILL RIVER, INCLUDING THE MAINTENANCE OF LONG TOM RIVER, OREG.

For history of this work, projects, and results accomplished, see current summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

Work on the Willamette River was carried on between Peoria and the mouth of the Clackamas River, a distance of 119 miles. Between Peoria and Corvallis the work consisted of snagging. From Corvallis downstream shoal bars were dredged, repairs were made to the revetment at Independence and to the dam at the head of Lamberts Slough, known as Wheatland Dam. A spur dike of piling and riprap stone was completed at the north end of Independence revetment, and work was commenced on a cut-off dam at Careys Bend. The work was done by the combined dredge and snag boat *Mathloma*, the dipper dredge *Champoeg* (formerly *No. 2*), and a floating pile driver.

The dredge *Mathloma* was in commission from July to November, inclusive, and during December, January, and February was thoroughly repaired and overhauled. The dredge has been in commission continuously from February 21 to the end of the fiscal year, and during the fiscal year has removed a total of 100,316 cubic yards of material from the following bars:

Names of bars.	Distance in miles above Portland.	Cubic yards.
Lower Lamberts	51½	3,238
Upper Lamberts	52	14,524
Allison	55	6,240
Smith	55½	3,145
Imlah	56½	6,176
Fletcher	57½	8,910
Eldridge	56½	5,589
Lower Martines	57½	6,562
Upper Martines	58	9,227
Eola	76	1,568
Wheatland	59	35,127
Total	....	100,316

The dredge with snagging gear removed, in addition, 150 snags from the bed of the river and 186 from the banks between Wheatland and Portland, also 256 from the bed and 710 from the banks between Peoria and Fairfield.

The *Mathloma* was employed 6 days during April on Lewis River removing 62 snags from the river bed and 64 from the banks.

The dredge *Champoeg* (formerly *No. 2*) was in commission July to November, inclusive, and during December, January, February, and March was undergoing repairs. The dredge was in commission from April 1 to the end of the fiscal year and has removed during the fiscal year a total of 43,433 cubic yards of material from the following bars:

Names of bars.	Distance in miles above Portland.	Cubic yards.
Five Islands	49	8,040
Coffee Chute	48	11,147
Careys Bend	44½	6,163
Upper Martines	58	7,276
Independence	83½	6,268
Budds Chute	80	4,549
Total	....	43,433

Twenty-six snags were also removed by the dredge from the river in the vicinity of Coffee Chute and Careys Bend.

The floating pile driver and crew were at work from July to November, inclusive. High water prevented further operations until April, when work was resumed and carried on to the end of the fiscal year. The work accomplished consisted of repairs to the revetment at Independence, the construction of a spur dike at the north end of the revetment at Independence, repairs to and reconstruction of Wheatland Dam, the commencement of a dam at Careys Bend, removing snags, and scraping bars at Budds Chute, Grey Eagle, and the mouth of the Yamhill River.

Following is a summary of operations during the fiscal year:

DREDGE MATHLOMA.

Snags removed from banks		896
Snags removed from channel		406
Gravel removed from channel	cubic yards	100, 316
Total length of cuts	linear feet	9, 300
Time actual dredging	hours	820
Time towing and snagging	do	689
Time moving, taking on wood, repairs, etc	do	574
Fuel consumed (wood)	cords	511
Average monthly cost of operations		$1, 200

DIPPER DREDGE CHAMPOEG.

Gravel removed from channel	cubic yards	43, 433
Total length of cuts	linear feet	5, 288
Time actual dredging	hours	843
Time moving, repairing, etc	do	857
Fuel consumed (wood)	cords	169
Average monthly cost of operations		$800

INDEPENDENCE REVETMENT.

Piles driven		25
Rock placed in work	cubic yards	74
Gravel placed in work	do	40
Pavement repaired	square yards	162
Cost of operations (labor only)		$254

SPUR DIKE AT INDEPENDENCE.

Piles driven		29
Rock placed in dike	cubic yards	466
Lumber used	feet b. m.	4, 730
Length of dike	linear feet	100
Cost of completed work		$2, 330

WHEATLAND DAM.

Piles driven		65
Rock placed in dam	cubic yards	2, 620
Lumber used	feet b. m.	18, 435
Length repaired	linear feet	620
Cost of operations		$12, 466

CAREYS BEND DAM.

Piles driven		87
Concrete (in bags) placed	cubic yards	30
Lumber used	feet b. m.	10, 759
Length constructed	linear feet	75
Cost of operations		$1, 484

SNAGS REMOVED BY BOAT PARTY BETWEEN CORVALLIS AND PEORIA.

Snags removed from river		362
Snags removed from bank		168
Powder used	pounds	2, 800
Cost of operations		$1, 233

During August 900 cubic yards of material were removed from the bar at the head of the Clackamas Rapids by a hired dredge and labor at a cost of $390.

During the fiscal year 243,124 cubic yards of material were dredged from the river between Portland and Milwaukee by private parties.

A 35-foot gasoline launch was constructed and placed in commission in October at a cost of $2,200. The launch has been used as a tender to the dredges and for dispatch and survey work on the river.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance	[1] $40,000

APPROPRIATIONS.

Appropriated prior to adoption of the present project (see H. Doc. No. 421, 57th Cong., 2d sess.)	$521,500.00
Apr. 28, 1904 (allotted June 3, 1904)	12,000.00
Mar. 3, 1905	50,000.00
Mar. 2, 1907	60,000.00
Mar. 3, 1909 (allotted Mar. 30, 1909, and Mar. 9, 1910)	25,000.00
July 25, 1910	60,000.00
Feb. 27, 1911	20,000.00
Received on account of sales, etc	525.61
Total	749,025.61

NOTE.—By act of Mar. 3, 1899, $3,000 was transferred to and expended on Long Tom River, Oreg.

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

American licensed river steamers	26
Net registered tonnage	4,490
Passengers	26,714

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	43 tons	43	$301	$0.046
Fish	15 tons	15	1,800	.06
Flour	13,306 barrels	1,304	65,200	.02
Fruit	600 tons	600	36,000	.045
Grain	268,750 bushels	7,210	163,200	.023
Hay and feed	1,724 tons	1,724	25,860	.025
Hops	2,654 tons	2,654	530,800	.043
Live stock	1,453 head	511	77,050	.085
Logs (towed)	17,453,723 feet b. m	34,907	104,721	.0085
Lumber	1,012,060 feet b. m	1,315	13,150	.025
Manufactured iron and steel	40 tons	40	1,400	.036
Merchandise	39,551 tons	39,551	3,956,100	.06
Miscellaneous	48,179 tons	48,179	2,890,740	.06
Oil (barged)	340,765 barrels	57,249	171,747	.04

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[1] Exclusive of the balance unexpended July 1, 1911.

Freight traffic—Continued.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Piles (towed)	388,500 linear feet	7,770	$31,080	$0.0085
Potatoes	3,808,000 pounds	1,904	38,080	.026
Sand and gravel	378,915 cubic yards	569,794	189,457	.005
Shingles	5,300 bundles	93	2,790	.05
Stone (barged)	769 cubic yards	1,153	1,153	.005
Wood (barged)	7,642 cords	11,463	28,658	.01
Wool	18 tons	18	3,960	.05
Total		787,497	8,332,247	

Average haul over portion of river under improvement, 70 miles. Total average haul on rivers, 70 miles.

U U 2.

OPERATING AND CARE OF LOCK AND DAM IN YAMHILL RIVER, OREG.

OPERATIONS DURING THE FISCAL YEAR 1911.

Operations during the year consisted in operating and keeping in repair the lock, dam, grounds, and Government plant and property connected therewith.

The lock was operated 44 times during the year, was closed to traffic during 45 days owing to high water, and was open during the remainder of the year.

No unusual repairs were needed, and the lock and connections were in good condition at the close of the year.

Summary of expenditures made in operating and caring for lock and dam in Yamhill River, Oreg., during the fiscal year ending June 30, 1911.

[Submitted in compliance with river and harbor act of July 5, 1884, and as amended by sec. 6 of the river and harbor act of Mar. 3, 1909.]

Office expenses, superintendence, and contingencies	$122.50
Labor	864.75
Materials for repair, etc	11.95
Total	999.20

ALLOTMENTS.

Allotments to June 12, 1902	$28,860.00
July 14, 1903	2,300.00
July 25, 1904	700.00
July 3, 1905	1,300.00
July 10, 1906	1,660.00
July 6, 1907	1,900.00
July 17, 1908	1,200.00
July 10, 1909	1,122.87
July 28, 1910	1,028.89
Total	40,071.76

COMMERCIAL STATISTICS.

Statement showing traffic through lock and dam in Yamhill River, Oreg., during fiscal year ending June 30, 1911.

Dates.	Lock open.	Lock closed.	Number lockages.	Freight carried through lock.	Passengers carried.
1910.	*Days.*	*Days.*		*Tons.*	
July	31		8		31
August	31		3		3
September	30		2	70½	
October	31		6		18
November	16	14	2		10
December	20	11	4		8
1911.					
January	17	14			
February	23	5			
March	31				
April	30		2		8
May	30	1	6		17
June	30		11		28
Total	320	45	44	70½	123

U U 3.

IMPROVEMENT OF WILLAMETTE RIVER, AT WILLAMETTE FALLS, OREG.

For history of this work, see current summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

The general project was adopted by the river and harbor act of June 25, 1910, and a survey was authorized under date of July 30, 1910.

Work was commenced in the early part of September by one field party engaged in making a survey and obtaining data for use in compiling report. The field work was completed in October and the work of compiling maps and estimates was completed and report of survey, with estimate of cost, submitted on April 24, 1911.

APPROPRIATION.

June 25, 1910	$300,000

COMMERCIAL STATISTICS.

Statement of traffic passing through the locks of the Willamette River at Oregon City, Oreg., during the calender year 1910.

[Submitted by Portland Railway, Light & Power Co., owners.]

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Launches	61			
Live stock	1,159 head	496	$66,610	$0.095
Logs (towed)	534,222 feet b. m.	1,068	3,204	.0085
Lumber	29,272 feet b. m.	38	380	.025
General merchandise	8,823 tons	8,823	882,300	.06
Piling (towed)	126 lockages		2,328	.0085
Wood (barged)	140 cords	210	525	.01
Passengers	7,129			
Total		10,625	955,347	

Average haul, 70 miles.

U U 4.

IMPROVEMENT OF COLUMBIA AND LOWER WILLAMETTE RIVERS BELOW PORTLAND, OREG.

For history of this work, projects, and results accomplished, see current summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

Operations during the fiscal year have consisted principally in dredging for maintenance of the channel between Portland and Astoria. The dredge *Clatsop* worked throughout the year at various bars between Mount Coffin and Astoria, removing a total of 2,353,626 cubic yards of material from the channel and depositing it in deep holes outside the channel. The depths over the different shoals were increased from 2 to 5½ feet. Details of the work are shown in Tables 1 and 2 herewith.

The dredge *Chinook*, when not at work on the bar, worked in the ship channel between Fort Stevens and Astoria and at Upper Sands above Astoria, removing a total of 510,351 cubic yards in 98 working days. For details of her work, see Table No. 4.

Under lease dated April 7, 1911, entered into with the port of Portland commission, the 30-inch dredge *Columbia* was engaged from April 20 to the end of the fiscal year in dredging a channel 8 feet deep on the west side of Swan Island, Willamette River, for use of log tows and shoal-water boats. A total of 634,800 cubic yards were removed. The dredge was hired at $350 per working day of 20 hours, an average of 4 hours per day being allowed for necessary repairs. For details of operations, see Table No. 3 herewith.

The dredges *Columbia* and *Portland*, belonging to the port of Portland commission, were also operated in the main ship channel, the expense being borne by the commission. Their reports indicate a total of 1,755,792 cubic yards excavated from the shoals between Portland and Slaughters and that the ruling depth obtained was 26 feet at mean low tide.

Considerable work was done at the United States moorings in making changes and repairs to dredges and other plant. With the increase in the amount of floating plant, some additions and improvements in the facilities at the moorings will be needed in the near future.

Model barge *A* was thoroughly overhauled and repaired at a cost of about $2,900 and model barge *B* is undergoing repairs, one-half of the cost of the work on the barges being charged to improving the mouth of the river.

A fuel-oil station was erected on the Three Tree Point Military Reservation, about 20 miles above Astoria, for supplying the dredges with fuel. The station includes a 10,000-barrel oil tank, with an 8-inch filling and discharge pipe carried on a dock 560 feet long, the dock having dolphins, etc., arranged so as to provide a convenient landing place for dredges and other vessels; a 10,000-gallon water tank filled from springs on the hills and having a 3-inch pipe extending to end of dock; a boiler house, equipped for heating the oil in cool weather; and a small residence for the use of the caretaker. The total cost of the station was approximately $13,000, one-half

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of which was charged to improving the mouth of the Columbia and one-half to the ship channel.

The usual low-water surveys of the bars were not required during the fiscal year, as the conditions had undergone little change since the surveys were made the year before to secure data for the preparation of the 30-foot project.

The channel in the lower Columbia and Willamette Rivers continues to improve, the ruling depth between Portland and the sea being about 24 feet at low water at the end of the year. The port of Portland commission systematically dredges to a greater depth each time a cut is made through the bars and the river appears to adapt itself to the new depths, which do not seem to deteriorate any faster than the old ones. The commission has had plans prepared for another 30-inch pipe-line dredge to increase its dredging plant.

Plans and specifications have been prepared in this office for a new hull for the tug *G. H. Mendell.*

Plans and specifications were prepared for the necessary additions and alterations in U. S. dredge *Clatsop* to change her from a coal to a fuel-oil burner. The work was advertised twice, but the bids were rejected on account of excessive price. At the end of the year the work had not been commenced.

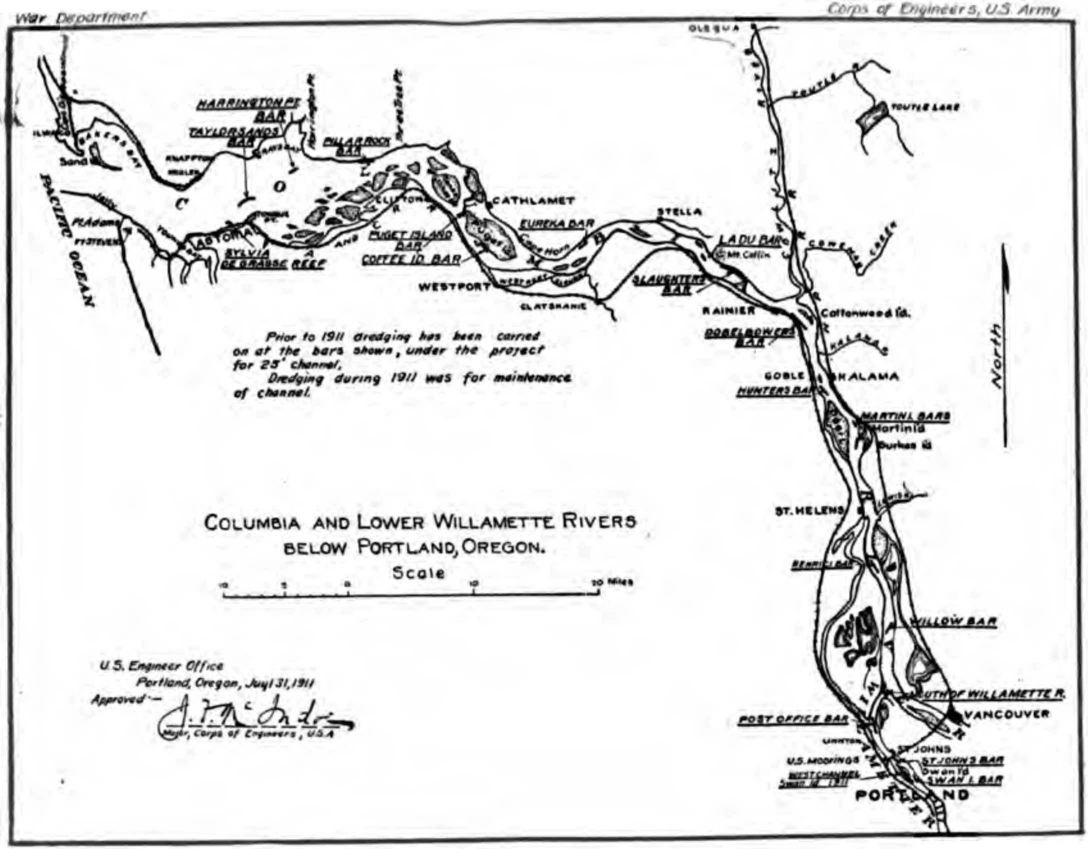
As authorized by the act of February 27, 1911, the work of preparing plans and specifications for two new dredging plants for the ship channel has been commenced.

TABLE 1.—*Work done by dredge Clatsop during fiscal year ending June 30, 1911.*

Location.	Period at work.	Days working.	Hours pumping.	Material moved.	Depths.	
					Before.	After.
				Cubic yards.	*Feet.*	*Feet.*
Taylor Sands	July 1 to Sept. 30, 1910 Apr. 1 to June 30, 1911	52 63	319 734	278,567 615,017	20	25½
No. 2 beacon bar	Dec. 1 to Dec. 31, 1910	21	266	281,969	22	25
Harrington Point bar	Oct. 18 to Nov. 30, 1910	30	268	194,436	20½	25
Pillar Rock bar	Jan. 1 to Feb. 28, 1911	31	401	579,305	22	26
Puget Island bar	Mar. 1 to Mar. 18, 1911	13	166	166,524	24	26
Eureka bar	Oct. 1 to Oct. 15, 1910	11	152	155,900	21½	26
La Du bar	Mar. 21 to Mar. 31, 1911	9	88	81,908	22	25
Total		230	2,394	2,353,626		

TABLE 2.—*Cost of dredging by the U. S. dredge Clatsop, including operating expenses, wages, subsistence, fuel, etc.*

Amount of material removed .... cubic yards..		2,353,626
Operating expenses, wages, subsistence, current repairs, etc		$45,278.89
4,641$\frac{2234}{2240}$ tons Aberdare coal, at $6.80	$31,565.58	
1,836$\frac{936}{2240}$ tons South Wellington coal, at $6.35	11,661.25	
		43,226.83
Total cost of operating		88,505.72
Cost per cubic yard for the fiscal year		$0.037604
Cost per cubic yard for coal, fiscal year		$0.018323
Coal consumed per cubic yard .... pounds..		6.17
Cubic yards dredged per ton of coal		363.3
Cubic yards per day's dredging		10,233



Prior to 1911 dredging has been carried on at the bars shown, under the project for 25' channel.
Dredging during 1911 was for maintenance of channel.

COLUMBIA AND LOWER WILLAMETTE RIVERS
BELOW PORTLAND, OREGON.

U.S. Engineer Office
Portland, Oregon, July 31, 1911
Approved:—
J. F. McIndoe
Major, Corps of Engineers, U.S.A.

Total amount of material moved by the dredge since her construction, in 1909:

Total to close of fiscal year ending June 30, 1910........cubic yards..	1,525,994
Amount dredged during the fiscal year ending June 30, 1911, cubic yards..	2,353,626
Total....................................cubic yards..	3,879,620

TABLE 3.—*Dredging West Channel, Swan Island, by port of Portland dredge Columbia during April, May, and June, 1911.*

	April.	May.	June.	Total.
Operating time..............................hours..	209.00	624.00	624.00	1,457.00
Days worked..	8.908	26.00	26.00	60.908
Time digging..................................hours..	113.40	419.00	479.20	1,012.00
Total delays, including washing boilers and moving anchors......................................hours..	95.20	205.00	144.40	445.00
Delays for repairs................................do....	52.55	63.40	38.55	155.30
Allowable delays for repairs, not to exceed 4 hours per day for any month..........................hours..	34.50	104.00	104.00	242.50
Amount paid for dredge..................................	$2,784.20	$9,100.00	$9,100.00	$20,984.20
Cost of inspection and shore work, as per pay rolls......	$535.61	$778.29	$670.65	$1,984.55
Cubic yards excavated (estimated).......................	62,500	274,000	298,300	634,800
Cubic yards placed on shore.............................	62,500	274,000	60,000	396,500

TABLE 4.—*Operating expenses of dredge Chinook from Sept. 20, 1910, to end of fiscal year.*

Dredged in Columbia River (98 days), excavated..........cubic yards..	510,351
Dredged on bar (62 days), excavated ....do....	212,080
Fuel oil consumed (27,965$\frac{41}{42}$ barrels).................................	$23,079.55
Pay roll..	$27,346.13
Water..	$45.00
Laundry and miscellaneous expense.....................................	$158.03
Subsistence supplies expended...	$5,306.24
Engine-room supplies expended...	$1,337.55
Other supplies expended...	$904.64
Ordinary repairs..	$766.31
Total number of cubic yards excavated................................	722,431
Total operating cost..	$58,943.45
Cost per cubic yard..	$0.08159

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance....................	[1] $500,000

APPROPRIATIONS.

Appropriated prior to adoption of the present project (see H. Doc. No. 421, 57th Cong., 2d sess.)..	$1,330,365.00
June 13, 1902..	225,000.00
April 28, 1904 (allotted June 4, 1904)................................	15,000.00
Mar. 3, 1905...	100,000.00
June 30, 1906..	125,000.00
Mar. 2, 1907...	300,000.00
Mar. 3, 1909 (allotted Mar. 31, 1909).................................	100,000.00
June 25, 1910..	175,000.00
Feb. 27, 1911..	350,000.00
Receipts from sales..	4,465.77
Total..	2,724,830.77

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[1] Exclusive of the balance unexpended July 1, 1911.

CONTRACTS IN FORCE.

Lease:
  Name of lessor: F. P. Kendall, Portland, Oreg.
  Date of lease: July 31, 1909.
  Character: Hire and lease of portion of "Holly Rood" Dock, Astoria, Oreg.
  Price: $15 per month.
  Approved: July 26, 1909.
  Date of beginning: August 1, 1909.
  Date of expiration: July 31, 1912.
Emergency contract:
  Name of contractor: Geo. W. Sanborn, Astoria, Oreg.
  Date of contract: June 15, 1910.
  Character: Furnishing and delivering coal.
  Quantity: Approximately 4,500 tons.
  Prices: $6.80 per ton of 2,240 pounds for Aberdare; $6.35 per ton of 2,240 pounds for South Wellington.
  Approved: Contract authorized by Chief of Engineers, May 20, 1910.
  Date of beginning: July 1, 1910.
  Date of expiration: June 30, 1911.
Emergency contract:
  Name of contractor: Thos. J. Shea, Portland, Oreg.
  Date of contract: January 12, 1911.
  Character: Furnishing and installing fuel oil tank.
  Quantity: One tank of 10,000 barrels capacity.
  Price: $7,685.
  Approved: Contract authorized by Chief of Engineers, August 11, 1910.
  Date of beginning: January 12, 1911.
  Date of expiration: May 11, 1911.
  NOTE.—This contract is also reported under report for "Improvement of the Mouth of Columbia River, Oregon and Washington."
Lease:
  Name of lessor: The Port of Portland, Portland, Oreg.
  Date of lease: April 7, 1911.
  Character: Hire and lease of 30-inch dredge with tender, etc.
  Price: $350 per day of 24 hours.
  Approved: Lease authorized by Chief of Engineers, March 25, 1911.
  Date of beginning: About April 10, 1911.
  Date of expiration: July 31, 1911.
Formal contract:
  Name of contractor: Associated Oil Co., San Francisco, Cal.
  Date of contract: May 12, 1911.
  Character: Furnishing and delivering fuel oil.
  Quantity: Approximately 11,000 barrels for use on dredge *Clatsop*.
  Price: 75 cents per barrel of 42 gallons.
  Approved: June 9, 1911.
  Date of beginning: June 1, 1911.
  Date of expiration: June 30, 1912.

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910.—Opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

DEEP-SEA CRAFT.

Classes.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Registered:					
Steamers	....	125	125	388,584	None.
Sailing	5	90	95	177,939	Do.
Unregistered (licensed and enrolled):					
Steamers	2,050	....	2,050	3,179,751	No record.
Sailing	145	....	145	119,206	Do.
Gasoline	197	....	197	17,131	Do.
Rafts	8	....	8	....	....
Total	2,405	215	[1] 2,620	3,882,611	....

[1] Arrivals and clearances, irrespective of number of vessels.

Vessel classification—Continued.

RIVER CRAFT.

Classes.	American.	Foreign.	Total.	Net registered tonnage.	Passengers.
Licensed river steamers	87	....	87	15,288	299,831
Barges and scows	16	....	16	5,027	....
Total	103	....	103	20,315	299,831

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
EXPORTS AND IMPORTS.				*Mills.*
Bags and burlap	5,230 tons	5,230	$488,934	0.694
Cement	80,852 barrels	19,202	119,061	.122
Coal	18,733 tons	18,733	47,313	.694
Coke	4,021 tons	4,021	14,187	.308
Fibers	1,703 tons	1,703	190,313	.793
Flour	283,679 barrels	27,800	1,186,654	.638
Fire brick and clay	7,149 tons	7,149	33,848	.191
Iron, pig and bar	8,774 tons	8,774	137,454	.184
Lumber	122,711,000 feet b. m	159,524	1,505,497	.620
Machinery	50 tons	50	1,445	.694
Rice	2,082 tons	2,082	90,662	.851
Sulphur	7,630 tons	7,630	124,643	.638
Wheat	5,120,826 bushels	153,624	4,511,403	.421
Total		415,522	8,451,414	....
DOMESTIC.				
Lumber	317,932,977 feet b. m	413,313	4,133,130	3.331
Logs	48,000,000 feet b. m	96,000	288,000	1.50
Oil	6,900,000 barrels	1,159,200	5,477,600	2.50
Miscellaneous	356,921 tons	356,921	21,415,260	5.00
Total		2,025,434	31,313,990	....
LOCAL.				
Coal	3,424 tons	3,424	23,968	20.00
Fish	13,223 tons	13,223	1,586,760	20.00
Flour	107,397 barrels	10,525	526,250	20.00
Fruit	3,478 tons	3,478	208,680	40.00
Grain	728,413 bushels	18,116	391,525	25.00
Hay and feed	11,483 tons	11,483	172,245	20.00
Hops	135 tons	135	27,000	50.00
Live stock	22,001 head	4,592	918,400	35.00
Logs (towed)	1,035,295,704 feet b. m	2,070,591	6,211,773	5.00
Lumber	13,930,960 feet b. m	18,110	181,100	20.00
Manufactured iron and steel	7,369 tons	7,369	257,915	25.00
Merchandise	55,146 tons	55,146	5,514,600	50.00
Miscellaneous	70,247 tons	70,247	4,214,820	50.00
Oil (barged)	1,872,582 barrels	314,594	1,343,782	30.00
Piles (towed)	14,017,887 linear feet	280,358	1,121,432	12.50
Potatoes	30,610,000 pounds	15,305	306,100	30.00
Sand and gravel (barged)	1,059,133 cubic yards	1,592,671	796,335	8.00
Shingles	2,193,733 bundles	38,390	1,151,700	28.00
Stone (barged)	562,364 cubic yards	843,550	84,355	10.00
Wood (barged)	14,603 cords	21,905	54,762	15.00
Wool	105 tons	105	23,100	50.00
Total		5,393,317	25,116,602	....

RECAPITULATION.

Exports and imports	415,522	$8,451,414	....
Domestic	2,025,434	31,313,990	....
Local	5,393,317	25,116,602	....
Grand total	7,834,273	64,882,006	....

Average haul over portion of rivers under improvement, 100 miles; total average haul, rivers and oceans, exports and imports, 8,000 miles; domestic, 800 miles; local, 100 miles.

U U 5.

IMPROVEMENT OF THE MOUTH OF COLUMBIA RIVER, OREG. AND WASH.

For history of this work, projects, and results accomplished, see current summary of this report.

OPERATIONS DURING FISCAL YEAR 1911.

At the beginning of the fiscal year the jetty tramway had been constructed to station 340+60, bent 1979, and the enrockment had been extended to station 337+18, bent 1960.

During the first half of the fiscal year the tramway was extended from station 340+60, bent 1979, to station 358+78, bent 2080, of which 74 bents were taken up, making the end of tramway at station 345+46, bent 2006. No trestle was lost during the winter storms of the present fiscal year, and in the spring that portion which had been taken up was rebuilt to station 355+72, bent 2063, which was the end on June 30, 1911.

Besides this extension about 400 piles were driven to strengthen the older parts of the trestle.

During the year a total of 660,070 tons of stone were received from the Columbia Contract Co., under contracts dated October 21, 1909, and September 16, 1910, and under open-market purchase, all at the price of $1.12 per ton. The delivery of stone has been regular and the quantity received during the last months of the fiscal year has been very satisfactory.

The enrockment was extended from station 337+18, bent 1960, to station 358+60, bent 2079. A large portion of the stone received was used in raising the enrockment between station 211+08, bent 1255, and station 337+18, bent 1960, which accounts for the comparatively small extension beyond the end of the preceding year. This process of feeding the slopes was made necessary during the past two years on account of the rapid extension in previous years, but has now become so reduced in amount that nearly all the stone to be received during the coming fiscal year can be used in extension.

The usual winter storms were experienced, but no loss of trestle resulted, although some damage was done to it. This result is due no doubt to the fact that 74 bents at the outer end, which were used for placing an apron, were taken up, and also on account of greater strength of the structure.

During the winter of 1910 a large amount of work was done in deepening slip at Dock A, which had become filled with stone and mud. A "Williams" bucket equipped with teeth was used and found very efficient, as it handled both the muck and stone of all sizes.

An infirmary was built at Fort Stevens and equipped for use in caring for injured engineer employees.

Considerable repairs were made on such buildings as needed it. These buildings at Fort Stevens were originally of the cheapest construction, and many of them have almost reached the end of their serviceability.

During the winter the derricks were overhauled and new parts installed where needed. Model barge *A* was put in thorough repair at a cost of about $2,900.

A larger tank was erected at the Sands and preparations made for the erection of a new 20,000-gallon tank near the wells.

The only additions made to the plant during the year were one Porter locomotive and two boilers for Mundy engines; also two generating sets, the latter by transfer from the fortifications. One of the sets has been installed and the shops fitted up with motors. The change from steam to electricity in the shops is proving very satisfactory and economical. Some minor additions of machines were also made to the shops.

The tracks had much necessary work done to them during the winter months, including the renewal of rails from station 211+98, bent 1260, to station 258+24, bent 1517. The deteriorating effect of the salt water and air is very great and a very large number of angle bars and bolts had to be renewed.

All the machine work required for repairing plant was done in the shops; also a large amount of work in connection with the defenses at the mouth of the Columbia River and for the dredges. Material for 20 new dump cars has been purchased and work commenced on them.

The bar survey was commenced on June 7 and completed on June 16, 1911. Weather conditions were good for sounding.

The survey shows a general movement of the opening through the bar about 2,500 feet to the northwest and a movement of the channel through this area of about 3,500 feet in the same direction. The width of this opening through the bar between 24-foot contours has remained practically unchanged, being approximately 8,000 feet, with the exception of two small lumps where depths of 24 feet or less were found. The controlling depths across this area from deep water inside to deep water outside vary from 25 feet to 27½ feet. There are two narrow channels with a least depth of 27 feet and one channel, lying between these, with a least depth of 27½ feet, which is an increase of 1 foot over the maximum controlling depth across the bar found in 1910.

Immediately inside the bar many changes have taken place. An extensive deep-water area has developed with depths of from 30 to 35 feet extending from the end of the jetty to the southeasterly end of Peacock Spit, while immediately east of this deep-water area and lying between it and the inside 30-foot contour considerable shoaling has taken place, amounting in places to 6 feet. This 30-foot contour has receded about 2,500 feet.

Peacock Spit along its ocean front shows small changes. There has been a slight advance of the 24-foot contour along the southerly portion and a recession along the northerly portion. On the south side the extreme point, which controls the width of the opening across the bar, has receded about 2,500 feet. Inside the bar the 24-foot contour of Peacock Spit has advanced for a considerable distance and has receded slightly along Republic Spit south of Sand Island.

The extreme northerly 24-foot contour of Clatsop Spit has advanced for a considerable distance, to an extent about equal to the recession of the 24-foot contour on Republic Spit on the other side of the river, and west of this advance it has receded, again conforming in direction to the movement of the same contour on the other side of the river. South of the end of the jetty the 24-foot contour of the extreme western point of Clatsop Spit has advanced about 2,000 feet, while the southerly contour has changed little.

The results shown by the survey are, on the whole, most satisfactory. There are evidently great changes taking place, most of which can be classed as favorable. The formation of the shoal inside the bar can not yet be considered as the beginning of a permanent obstruction, as it is probably due to causes which will disappear as the jetty advances and the equilibrium which has been disturbed becomes readjusted.

One of the most promising features is the fact that the bar is pitted with deep holes, indicating that at any time a deeper channel than now exists may develop.

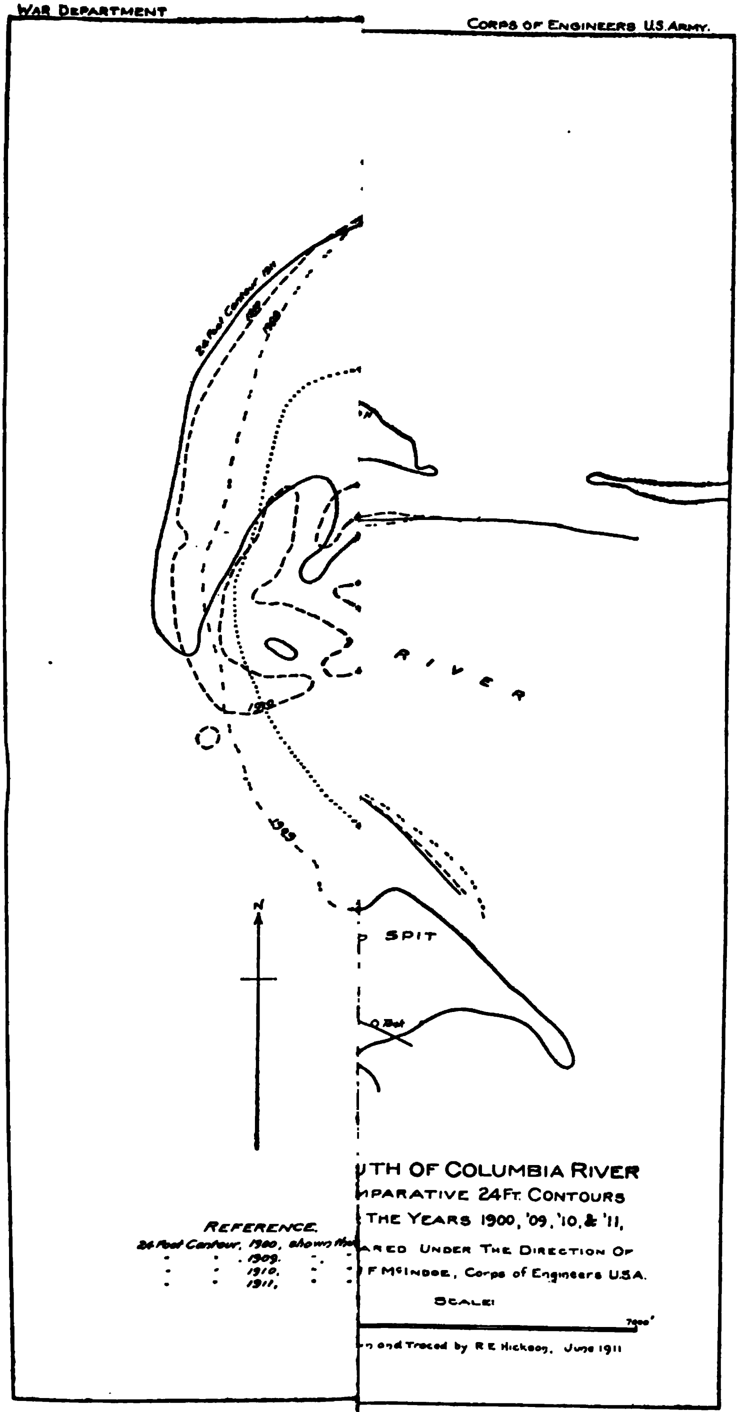
During the past year the dredge *Chinook* worked on a line passing about 1,000 feet northwest of buoy No. 2 toward the mid-channel buoy. This line was in the deep water as shown by the survey of 1910, but owing to changes caused by jetty extension it is now shoaler than before dredging was commenced, while the deepest water is now over half a mile to the northwest. The 24-foot contour at the westerly point of Clatsop Spit is now within 500 feet of the line of dredging, which shows a minimum depth of 25½ feet with 24½ feet 500 feet to the west and 23½ feet 500 feet to the east.

A survey, extending from Canby Light to Megler, was made in January for the purpose of securing data to determine the best plan for the construction of the north jetty.

The survey included the shore line and soundings in Bakers Bay, all of Sand Island, and some topography at Fort Canby.

The repairs and alterations of the dredge *Chinook*, under contract dated January 6, 1910, with the Marine Iron Works of Portland, were completed August 25, 1910. The work included a thorough overhauling of boilers, installation of fuel-oil burning system, entire removal of hurricane deck, saloon deck, and most of the spar deck, lowering all pumping machinery, pipes, etc., one deck, thereby materially reducing her draft.

The dredge was put in commission on September 20, 1910, and commenced work on the Columbia River Bar. From the above date until December 14 the dredge worked on the bar 19 days and in the channel below Astoria 33 days (working here when the bar was too rough), and removed 59,756 cubic yards and 113,363 cubic yards of material, respectively, at these localities. During that period much time was lost through the constant breaking of the suction pipes while working on the bar. The suction pipes were equipped with ball and socket joints and slip joints, the latter placed near the drag heads. On December 14 the crew was reduced and the dredge laid up at Flavel Dock on account of all the suction-pipe elbows on hand having been broken. On January 23 she was again put into commission for work on the ship channel of the lower Columbia, and continued operations there until April 14, when preparations were commenced for beginning work again on the bar. These preparations which included installation of new liners and the replacing of the ball and socket joints and slip joints by rubber suctions, were not



UTH OF COLUMBIA RIVER
NPARATIVE 24 FT. CONTOURS
THE YEARS 1900, '09, '10, & '11,
ARED UNDER THE DIRECTION OF
F McINDOE, Corps of Engineers U.S.A.

n and Traced by R E Hickson, June 1911

2612

completed until May 4, when work was again commenced on the bar. It is the intention to experiment further during the summer weather with the ball and socket and slip joints. From May 4 until the end of the fiscal year the dredge worked on the bar whenever weather conditions permitted. During the fiscal year she dredged on 62 days on the bar and removed 212,080 cubic yards of material. For details of operating expenses, see Table No. 4 under Improving Lower Columbia River.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement and for maintenance	[1] $1,343,920

APPROPRIATIONS.

Appropriated prior to adoption of the present project (see H. Doc. No. 421, 57th Cong., 2d sess.)	$2,043,180.00
Less amount transferred by act of June 3, 1896, to improvement below Tongue Point	50,000.00
	1,993,180.00
June 6, 1900	250,000.00
June 13, 1902	500,000.00
Mar. 3, 1903	1,000,000.00
Mar. 3, 1905	$400,000.00
Apr. 23, 1906	400,000.00
June 30, 1906	300,000.00
Mar. 2, 1907	750 244.00
May 27, 1908	1,450,000.00
Mar. 3, 1909 (allotted Apr. 20, 1909)	700,000.00
Mar. 4, 1909	250,000.00
June 25, 1910	1,200,000.00
Feb. 27, 1911	950,000.00
Receipts from sales	1,608.24
Total	10,145,032.24

CONTRACTS IN FORCE.

Formal:

Name of contractor: Columbia Contract Co., Portland, Oreg.
Date of contract: September 16, 1910.
Character: Furnishing and delivering stone.
Quantities: About 525,000 tons weighing less than 15 tons per stone; about 75,000 tons weighing 15 to 25 tons per stone.
Prices: $1.12 per ton of 2,000 pounds for first item; $1.25 per ton of 2,000 pounds for second item.
Approved: September 26, 1910.
Date of beginning: 10 days after date of receipt of notification of approval of contract.
Date of expiration: Indefinite; about 200 working days after date of beginning.

Emergency:

Name of contractor: Thos. J. Shea, Portland, Oreg.
Date of contract: January 12, 1911.
Character: Furnishing and installing fuel oil tank.
Quantity: One tank of 10,000 barrels capacity.
Price: $7,685.
Approved: Contract authorized by Chief of Engineers, August 11, 1910.
Date of beginning: January 12, 1911.
Date of expiration: May 11, 1911.
NOTE.—This contract is also reported under report for "Improvement of Columbia and Lower Willamette Rivers below Portland, Oreg."

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[1] Exclusive of the balance unexpended July 1, 1911.

Lease:
Name of lessee: Columbia River Packers Association, Astoria, Oreg.
Date of lease: March 28, 1911.
Character: Lease of certain United States land on Sand Island, at mouth of Columbia River, Oreg. and Wash.
Price: $12,509 per annum.
Approved by Assistant Secretary of War, May 2, 1911.
Date of beginning: May 1, 1911.
Date of expiration: April 30, 1914.

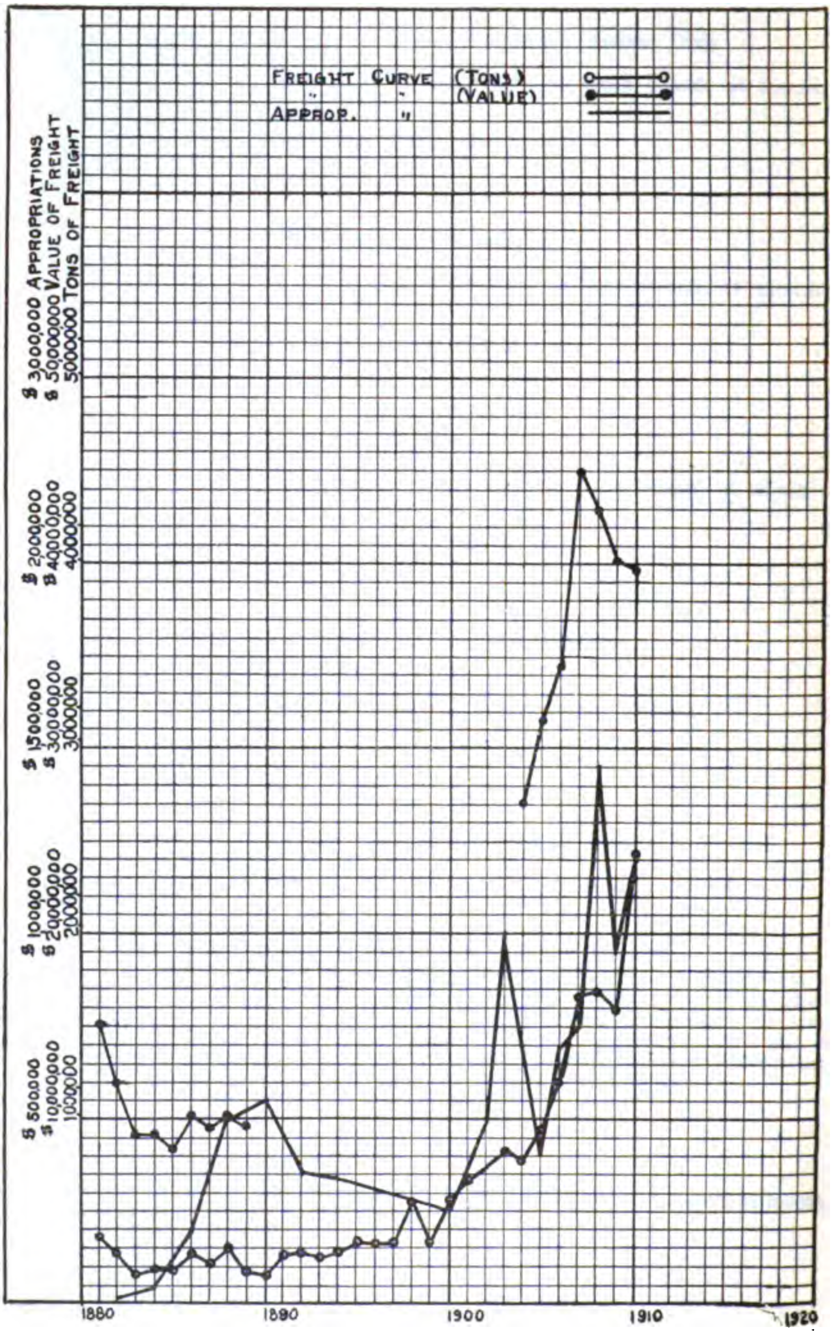
Lease:
Name of lessee: Booth Fisheries Co., Astoria, Oreg.
Date of lease: March 28, 1911.
Character: Lease of certain United States land on Sand Island, at mouth of Columbia River, Oreg. and Wash.
Price: $210 per annum.
Approved by Assistant Secretary of War, May 2, 1911.
Date of beginning: May 1, 1911.
Date of expiration: April 30, 1914.

Lease:
Name of lessee: Alex Muller, Astoria, Oreg.
Date of lease: March 28, 1911.
Character: Lease of certain United States land on Sand Island, at mouth of Columbia River, Oreg. and Wash.
Price: $86 per annum.
Approved by Assistant Secretary of War, May 2, 1911.
Date of beginning: May 1, 1911.
Date of expiration: April 30, 1914.

Formal contract:
Name of contractor: Associated Oil Co., San Francisco, Cal.
Date of contract: May 12, 1911.
Character: Furnishing and delivering fuel oil.
Quantity: Approximately 39,000 barrels for use on dredge *Chinook*.
Price: 75 cents per barrel of 42 gallons.
Approved: June 9, 1911.
Date of beginning: June 1, 1911.
Date of expiration: June 30, 1912.

Formal contract:
Name of contractor: The Marine Iron Works, Portland, Oreg.
Date of contract: January 6, 1910.
Character: Repairs, alterations, and additions to U. S. dredge *Chinook*.
Price: $132,000.
Approved: January 18, 1910.
Date of beginning: 15 days after date of notification of approval.
Date of expiration: 4 months and 15 days from date of notification of approval.
Supplemental agreement to above, dated February 9, 1910, approved by Assistant Secretary of War March 15, 1910, provides for certain modifications to paragraph 87 of specifications covered by agreement dated January 6, 1910, and in consideration of increased cost to the contractor, caused by said modifications, he shall be paid $5,075 in addition to the amount named above.
Time for completion extended to August 26, 1910.

Lease:
Name of lessee: John Service, Astoria, Oreg.
Date of lease: April 15, 1908.
Character: Lease of certain parcel of United States land on Sand Island, at mouth of Columbia River, Oreg. and Wash.
Price: $1,450 per annum.
Approved by Assistant Secretary of War, June 3, 1908.
Date of beginning: May 1, 1908.
Date of expiration: April 30, 1911.



MOUTH OF COLUMBIA RIVER
OREGON & WASHINGTON

Lease:
Name of lessee: Chris Hansen, Chinook, Wash.
Date of lease: April 16, 1908.
Character: Lease of certain parcel of United States land on Sand Island, at mouth of Columbia River, Oreg. and Wash.
Price: $150 per annum.
Approved by Assistant Secretary of War, June 3, 1908.
Date of beginning: May 1, 1908.
Date of expiration: April 30, 1911.

Lease:
Name of lessee: Columbia River Packers' Association, Astoria, Oreg.
Date of lease: May 1, 1908.
Character: Lease of certain parcel of United States land on Sand Island, at mouth of Columbia River, Oreg. and Wash.
Price: $5,175 per annum.
Approved by Assistant Secretary of War, June 3, 1908.
Date of beginning: May 1, 1908.
Date of expiration: April 30, 1911.

Formal:
Name of contractor: Columbia Contract Co., Portland, Oreg.
Date of contract: October 21, 1909.
Character: Furnishing and delivering stone.
Quantity: 380,000 tons, more or less.
Price: $1.12 per ton of 2,000 pounds.
Approved: November 18, 1909.
Date of beginning: 10 days after date of notification of approval of contract.
Date of expiration: 120 working days from date of beginning, it being understood that only such days as the work of receiving jetty stone is carried on are to be counted as working days.

Emergency:
Name of contractor: Geo. W. Sanborn, Astoria, Oreg.
Date of contract: June 15, 1910.
Character: Furnishing and delivering coal.
Quantity: Approximately 4,500 tons.
Price: $5.80 per ton of 2,240 pounds.
Approved: Contract authorized by Chief of Engineers, May 20, 1910.
Date of beginning: July 1, 1910.
Date of expiration: June 30, 1911.

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	....	125	125	388,584
Sailing	5	90	95	177,939
Unregistered (licensed and enrolled):				
Steamers	2,050	....	2,050	3,179,751
Sailing	145	....	145	119,206
Gasoline	197	....	197	17,131
Rafts	8	....	8	....
Total	2,405	215	[1] 2,620	3,882,611

[1] Arrivals and clearances, irrespective of number of vessels.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
EXPORTS AND IMPORTS.				*Mills.*
Bags and burlap	5,230 tons	5,230	$488,934	0.694
Cement	80,852 barrels	19,202	119,061	.122
Coal	18,733 tons	18,733	47,313	.694
Coke	4,021 tons	4,021	14,187	.308
Fibers	1,703 tons	1,703	190,313	.793
Flour	283,679 barrels	27,800	1,186,654	.638
Fire brick and clay	7,149 tons	7,149	33,848	.191
Iron, pig and bar	8,774 tons	8,774	137,454	.184
Lumber	122,711,000 feet b. m	159,524	1,505,497	.620
Machinery	50 tons	50	1,445	.694
Rice	2,082 tons	2,082	90,662	.851
Sulphur	7,630 tons	7,630	124,643	.638
Wheat	5,120,826 bushels	153,624	4,511,403	.421
Total		415,522	8,451,414	
DOMESTIC.				
Lumber	317,932,977 feet b. m	413,313	4,133,130	3.331
Logs	48,000,000 feet b. m	96,000	288,000	1.50
Oil, crude	6,900,000 barrels	1,159,200	5,477,600	2.50
Miscellaneous	356,921 tons	356,921	21,415,260	5.00
Total		2,025,434	31,313,990	
Grand total		2,440,956	39,765,404	

Average haul over portion of river under improvement, 7½ miles; exports and imports, foreign traffic, 8,000 miles; domestic coastwise traffic, 800 miles.

U U 6.

IMPROVEMENT OF CLATSKANIE RIVER, OREG.

For history of this work, projects, and results accomplished, see current summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

The U. S. dredge *Cowlitz* commenced work on the Clatskanie River November 4, 1910, and dredged the channel to the project depth of 6 feet at low water, from the town of Clatskanie to the railroad bridge, a distance of about 1 mile.

The work was completed December 29, 1910, when the dredge and plant was towed to the Government moorings, Portland, Oreg., and laid up, December 31, for the winter.

At Chinaman Bend on each side of the river a bulkhead was constructed, consisting of a single row of piling, driven 3 feet between centers, with 3-inch by 12-inch planks spiked to inside face of piles to prevent the dredged material from returning to the channel.

In connection with the reclamation of the low, marshy lands adjacent to the river, the Columbia Agricultural Co. have during the year dredged the channel from the mouth to below the railroad bridge, using the dredged material on the levees.

The new channel previously completed by the above-mentioned company across a bend near the mouth of the river was deeded to the United States August 19, 1910, in accordance with the provisions of permit dated January 5, 1909.

Following is a summary of the operations during the fiscal year:

Distance moved	miles..	112
Material dredged (sand and gravel)	cubic yards..	27,261
Aggregate length of cut	linear feet..	3,600
Average width of cut	feet..	50
Actual time of dredging	hours..	313
Time moving, general repairs, taking wood, etc	do....	177
Fuel consumed, wood	cords..	55
Piles driven (4,022 linear feet)		153
Lumber, 3 by 12 inches	feet b. m..	6,000
Snags removed from channel by boat		31
Available navigable depth before dredging	feet..	1
Available navigable depth after dredging	do....	6

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement.......... [1] $1,000

APPROPRIATIONS.

Mar. 3, 1899	$13,000.00
Reverted to surplus fund (act of Mar. 4, 1909)	324.53
	12,675.47
June 25, 1910	5,200.00
Total	17,875.47

COMMERCIAL STATISTICS.

Season of navigation.—Year, 1910; opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

American licensed river steamers	13
Net registered tonnage	3,197
Passengers	310

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	12 tons	12	$84	$0.0285
Fish	274 tons	274	32,880	.055
Flour	2,796 barrels	274	13,700	.0285
Fruit	75 tons	75	4,500	.055
Grain	17,250 bushels	827	12,250	.03
Hay and feed	80 tons	80	1,200	.03
Hops	15 tons	15	3,000	.055
Live stock	132 head	47	7,100	.04
Logs (towed)	30,348,461 feet b. m	60,696	182,088	.0055
Lumber	100,000 feet b. m	130	1,300	.02
Merchandise	2,132 tons	2,132	213,200	.071
Miscellaneous	109 tons	109	6,540	.055
Oil (barged)	6,702 barrels	1,126	4,878	.048
Piles (towed)	19,885 linear feet	398	1,592	.008
Potatoes	40,000 pounds	20	400	.03
Shingles	48,028 bundles	840	25,200	.033
Wool	2 tons	2	440	.055
Total		67,057	509,852	

Average haul on portion of river under improvement, 2 miles; total average haul on rivers, 70 miles.

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[1] Exclusive of the balance unexpended July 1, 1911.

U U 7.

IMPROVEMENTS OF COWLITZ AND LEWIS RIVERS, WASH.

For history of these works, projects, and results accomplished, see current summary of this report.

(A) OPERATIONS DURING THE FISCAL YEAR 1911 FOR COWLITZ RIVER, WASH.

No work was done on the Cowlitz River during the fiscal year except blasting 24 snags from the channel between Toledo and Olequa and clearing the overhanging brush from the river in the vicinity of Keegan Bar.

The season for active operations was too far advanced before the necessary repairs to the dredging plant were completed, and as the period for dredging operations is somewhat limited, it was deemed more economical and advantageous to commence the work after the summer freshet in the Columbia River begins to recede.

Under permits to dredge for sand and gravel for commercial purposes, the Cowlitz Bridge Co. and the Hurley, Mason Co. removed 2,386 and 2,616 cubic yards, respectively, of material from the channel of the river during the fiscal year.

During the early part of the year the dipper dredge *No. 1*, subsequently named *Cowlitz,* was overhauled, new spuds and boom installed, boiler, engines, and machinery placed in good condition, and a 1½-cubic yard clam-shell bucket purchased. During the winter months the house of the dredge was remodeled and living quarters for the crew built, and in addition to the bucket rigging a supplemental 8-inch centrifugal sand-dredging plant was installed for the purpose of pumping sand in the tidal portions of the stream, where this method of dredging is applicable.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $3,000

APPROPRIATIONS.

Appropriated to June 13, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$35,750
Mar. 3, 1905 (allotted Apr. 7, 1905)	4,400
Mar. 2, 1907 (allotted May 1, 1907)	12,500
June 25, 1910 (allotted Aug. 4, 1910)	31,600
Total	84,250

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[1] Exclusive of the balance unexpended July 1, 1911.

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

American licensed river steamers	16
Net registered tonnage	3,072
Passengers	9,500

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	50 tons	50	$350	$0.08
Fish	500 tons	500	60,000	.05
Flour	40,816 barrels	4,000	200,000	.04
Fruit	350 tons	350	21,000	.05
Grain	58,959 bushels	1,425	38,750	.085
Hay and feed	6,500 tons	6,500	97,500	.035
Hops	115 tons	115	23,000	.035
Live stock	2,500 head	350	56,250	.06
Logs (towed)	134,465,015 feet b. m	268,930	806,790	.0062
Lumber	4,655,000 feet b. m	6,051	60,515	.025
Manufactured iron and steel	50 tons	50	1,750	.035
Merchandise	8,000 tons	8,000	800,000	.045
Oil	450 barrels	76	328	.07
Piles (towed)	1,233,415 linear feet	24,668	98,672	.0125
Potatoes	10,000,000 pounds	5,000	100,000	.035
Shingles	1,041,600 bundles	18,228	546,840	.045
Wood	200 cords	300	750	.08
Wool	4 tons	4	880	.06
Total		344,597	2,913,375	

Average haul on portion of river under improvement 20 miles; total average haul on rivers 65 miles.

(B) OPERATIONS DURING THE FISCAL YEAR 1911 FOR LEWIS RIVER, WASH.

After the repairs to the plant were completed, the dredge *Cowlitz* was placed in commission on September 28 and commenced dredging at the mouth of the Lewis River. Dredging was carried on at Kuhnis and Davis bars, after which the plant was transferred to the Clatskanie River. On May 10 the dredging plant was again towed to the Lewis River, beginning dredging operations on the East Fork below La Center, and continuing downstream where work was done at the Cowley and Shuttie bars and at various shoals to the mouth of the East Fork. Work was completed on June 22, and the channel was left in good condition for light-draft navigation.

The snag boat *Mathloma* was employed during a few days in April and worked on the North Fork between the mouth and 1 mile below Woodland. A total of 67 snags were removed from the channel and 64 trees cut from the banks.

Considerable work has been done by private parties, also by the county authorities, in protecting the high banks at various localities along the main river and the North Fork as far as Woodland.

A stadia survey for comparison with previous surveys was made during November from the mouth of the river extending upstream for about 3,000 feet.

The following is a summary of the operations during the fiscal year:

Material removed from channel (sand and gravel)	cubic yards..	29,925
Total length of cut	linear feet..	4,790
Average width of cut	feet..	50
Time actual dredging	hours..	421
Time moving, general repairs, etc	do....	273
Fuel consumed:		
Wood	cords..	64
Coal	tons..	6
Snags removed from channel		67
Trees cut from bank		64
Average monthly cost of operations		$900

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $2,500

CONSOLIDATED.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $5,500

APPROPRIATIONS.

Appropriated to June 13, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$14,750
Mar. 3, 1905 (allotted Apr. 7, 1905)	5,600
Mar. 2, 1907 (allotted May 1, 1907)	2,500
June 25, 1910 (allotted Aug. 4, 1910)	2,500
Feb. 27, 1911 (allotted Apr. 8, 1911)	2,500
Total	27,850

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

American licensed river steamers	16
Net registered tonnage	2,934
Passengers	6,450

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[1] Exclusive of the balance unexpended July 1, 1911.

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	4 tons	4	$28	$0.0375
Fish	186 tons	186	22,320	.10
Flour	92 barrels	9	450	.04
Fruit	113 tons	113	6,780	.05
Grain	58,550 bushels	1,751	41,665	.0375
Hay and feed	1,739 tons	1,739	26,085	.0375
Live stock	3,129 head	824	126,075	.08
Logs (towed)	47,000,000 feet b. m	94,000	282,000	.0082
Lumber	25,135,672 feet b. m	32,676	326,760	.033
Manufactured iron and steel	144 tons	144	5,040	.0375
Merchandise	6,799 tons	6,799	679,900	.10
Oil	558 barrels	94	482	.0625
Piles (towed)	70,000 linear feet	1,400	5,600	.01
Potatoes	10,256,000 pounds	5,128	102,560	.05
Stone	10 cubic yards	15	15	.0375
Wood (barged)	300 cords	450	1,125	.015
Wool	33 tons	33	7,260	.10
Total		145,365	1,634,145	

Average haul on portion of river under improvement, 20 miles; total average haul on rivers, 65 miles.

U U 8.

IMPROVEMENT OF GRAYS RIVER, WASH.

For history of this work, project, and results accomplished, reference is invited to current summary of this report.

OPERATIONS DURING THE FISCAL YEAR 1911.

No work was carried on during the fiscal year. Navigation on the river is regulated according to the stage of tides, and it was not until recently reported that the shoaling of the river just below the head of navigation and numerous snags in the channel were a menace to navigation. The removal of these obstructions is contemplated during the coming season.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $500

APPROPRIATIONS.

Mar. 2, 1907	$2,500
June 25, 1910	500
Feb. 27, 1911	500
Total	3,500

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[1] Exclusive of the balance unexpended July 1, 1911.

COMMERCIAL STATISTICS.

Season of navigation.—Year 1910: Opened, January 1, 1910; closed, December 31, 1910.

Vessel classification.

American licensed river steamers	7
Net registered tonnage	1,585
Passengers	6,000

Freight traffic.

Articles.	Amount (customary units).	Amount in short tons.	Valuation.	Rate per ton-mile.
Coal	50 tons	50	$350	$0.02
Fish	15 tons	15	1,800	.02
Flour	1,500 barrels	147	7,350	.02
Fruit	2 tons	2	120	.03
Grain	14,000 bushels	350	10,875	.025
Hay and feed	90 tons	90	1,350	.025
Live stock	1,750 head	204	33,450	.035
Logs (towed)	34.700,761 feet b. m	69,402	208,206	.005
Lumber	300,000 feet b. m	390	3,900	.02
Manufactured iron and steel	100 tons	100	3,500	.02
Merchandise	200 tons	200	20,000	.05
Miscellaneous	15 tons	15	900	.06
Oil	2,700 barrels	454	1,662	.03
Piles (towed)	135,962 linear feet	2,719	10,876	.01
Potatoes	200,000 pounds	100	2,000	.03
Sand and gravel	33 cubic yards	50	50	.02
Shingles	115,000 bundles	2,013	60,390	.02
Wood (barged)	700 cords	1,050	2,625	.02
Total		77,351	369,404	

Average haul on portion of river under improvement, 8 miles; total average haul on rivers, 52 miles.

U U 9.

GAUGING WATERS OF COLUMBIA RIVER.

OPERATIONS DURING THE FISCAL YEAR 1911.

Gauges were established during March, 1911, as follows: One on the Willamette at Linnton; one at the mouth of the Willamette and nine on the Columbia River at the following points: Willow Bar, Warrior Rock, Martins Bluff, Kalama, Slaughters Bar, Stella, Waterford, Cathlamet, and Elliotts Point. Readings were commenced at the above stations on May 15, 1911.

The gauges are all staff gauges, and were set as nearly right as possible. A concrete bench mark was set at each station, and its elevation above the zero of the gauge determined. The zero of the gauge at each point is to correspond with low water in the river at that point.

When sufficient readings have been taken these gauges will be corrected where necessary and connected by a line of levels to determine the slope of the river. Current measurements will be taken later and the discharge at different stages determined.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] $1,000

APPROPRIATIONS.

Total amount appropriated to June 13, 1902 (see H. Doc. No. 421, 57th Cong., 2d sess.)	$9,000
Mar. 3, 1905	1,000
June 25, 1910	1,000
Feb. 27, 1911	1,000
Total	12,000

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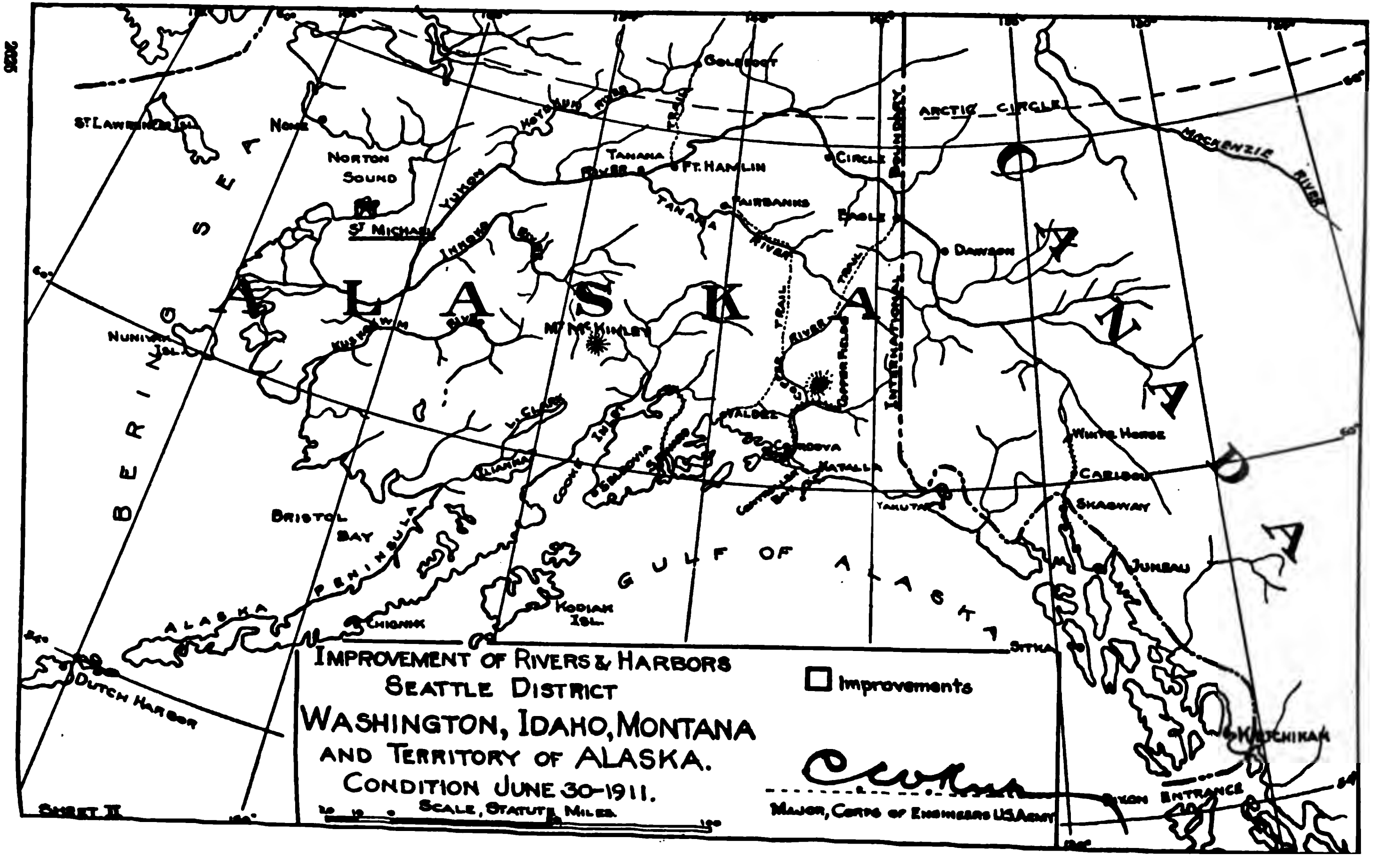
[1] Exclusive of the balance unexpended July 1, 1911.



IMPROVEMENT OF RIVERS & HARBORS
SEATTLE DISTRICT
WASHINGTON, IDAHO, MONTANA
AND TERRITORY OF ALASKA.
CONDITION JUNE 30–1911.

☐ Improvements

SCALE, STATUTE MILES.
20 10 0 50 100

MAJOR, CORPS OF ENGINEERS U.S.ARMY.

APPENDIX V V.

IMPROVEMENT OF RIVERS AND HARBORS IN THE SEATTLE, WASH., DISTRICT.

REPORT OF MAJ. C. W. KUTZ, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Willapa River and Harbor, Wash.
2. Grays Harbor and bar entrance, Wash.
3. Grays Harbor, inner portion, between Aberdeen and the entrance to said harbor, and Chehalis River, Wash.
4. Puget Sound and its tributary waters, Wash.
5. Harbor at Olympia, Wash.
6. Hammersley Inlet, Wash.
7. Tacoma Harbor, Wash.
8. Waterway connecting Puget Sound with lakes Union and Washington, Wash.
9. Snohomish River, Wash.
10. Skagit River, Wash.
11. Swinomish Slough, Wash.
12. New Whatcom (Bellingham) Harbor, Wash.
13. Columbia River between Wenatchee and Bridgeport, Wash.
14. Columbia River, Bridgeport to Kettle Falls, Wash.
15. Okanogan and Pend Oreille Rivers, Wash.
16. Polson Bay, Flathead Lake, Mont.
17. St. Michael Canal, Alaska.

UNITED STATES ENGINEER OFFICE,
Seattle, Wash., July 18, 1911.

SIR: I have the honor to forward herewith annual report of the river and harbor works in my charge for the fiscal year ending June 30, 1911.

Very respectfully,

C. W. KUTZ,
Major, Corps of Engineers.

The CHIEF OF ENGINEERS UNITED STATES ARMY.

V V 1.

IMPROVEMENT OF WILLAPA RIVER AND HARBOR, WASH.

The sum of $50,000 was appropriated by the act of June 25, 1910, for work under the enlarged project. The estimated cost of the work was $218,132.20. Bids were received for dredging between South Bend and Raymond, and action on the bids was deferred until it was known that additional funds would be provided for the work, when all bids were rejected.

The act of February 27, 1911, provided the additional sum of $50,000, and authorized a continuing contract for completion of the project.

The conditions contained in the act of June 25, 1910, relative to local cooperation have been complied with and bids for the whole work will be opened on July 26, 1911.

There were no operations during the fiscal year.

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902 (p. 325, H. Doc. No. 421, 57th Cong., 2d sess.)	$36,350
Act of Mar. 2, 1907	25,000
Act of June 25, 1910	50,000
Act of Feb. 27, 1911	50,000
Received from sales	18.40
Total	161,368.40

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Fish, fresh		602	$31,992
Fruit, fresh		20	1,000
Gravel and sand	8,000 cubic yards	10,800	3,600
Hay		55	729
Lath	25,000,000 pieces	4,687	37,500
Logs	172,609,374 feet b. m	259,003	1,553,484
Lumber	131,245,726 feet b. m	196,869	1,560,951
Merchandise, general		6,306	630,600
Seed oysters		1,160	174,000
Shellfish		583	75,970
Shingles	67,692,000 pieces	6,431	120,584
Total		486,516	4,190,410

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1]$118,132

V V 2.

IMPROVEMENT OF GRAYS HARBOR AND BAR ENTRANCE, WASH.

Operations consisted of extending the north jetty, placing stone, and making repairs to the jetty trestle and plant.

Extension of jetty was commenced on August 10, 1910, suspended October 13, 1910, and resumed May 20, 1911.

The total length of trestle constructed during the year was 2,784 feet. Mattress foundations were placed for a distance of 2,656 feet.

During the period July 1 to November 3, 1910, 52,423.58 tons of stone were delivered under contract of March 29, 1908, at unit price of $1.55 per ton. This contract was terminated on January 16, 1911.

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[1] Exclusive of the balance unexpended July 1, 1911.

Under continuing-contract authorization made by the act of February 27, 1911, a formal contract was made for furnishing 375,000 tons of stone, delivered on barges at South Aberdeen, Wash., at the average price of $1.61 per ton. Delivery of stone under this contract commenced on June 16, 1911, and 4,191.325 tons were delivered to June 30, 1911.

Emergency contracts were made for furnishing brush fascines, piling, and grillage poles at the prices given under "contracts in force."

The following quantities of materials were received during the year:

Stone	tons..	56,614.905
Brush fascines	cords..	2,836.5
Piles		1,520
Poles		5,684
Lumber	feet b. m..	393,174
Steel rails	tons..	151

The stone received during the year was used to bring the jetty embankment above the plane of mid-tide and for weighting mattresses.

But slight damage was done to the jetty trestle by winter storms; 6 complete bents and 65 single piles were lost.

At the close of the year the jetty trestle had been built for a distance of 12,784 feet from the ocean high-water line; mattress foundation placed to bent No. 1016, 12,656 feet from the ocean high-water line, and the enrockment brought to mid-tide elevation for a distance of 9,376 feet.

A survey of the bar was made during May, 1911, and the results are shown on the map[1] submitted herewith.

CONTRACTS IN FORCE.

Contractors: Independent Asphalt Paving Co. and Northwestern Contract Co.
Character of work: Furnishing and delivering 250,000 tons of stone.
Price: $1.55 per ton of 2,000 pounds.
Date of contract: March 28, 1908.
Date of approval: May 5, 1908.
Date of commencement: May 18, 1908.
Date of completion: Terminated January 16, 1911.

Contractor: Hercules Sandstone Co.
Character of work: Furnishing and delivering 357,000 tons of stone.
Price (average): $1.61 per ton of 2,000 pounds.
Date of contract: May 12, 1911.
Date of approval: June 7, 1911.
Date of commencement: June 12, 1911.
Date of completion: Working season of 1913.

Emergency.
Contractor: C. W. Green.
Character of work: Furnishing fir piling.
Price: 17½ cents per linear foot.
Date of contract: July 1, 1910.
Date of commencement: July 20, 1910.
Date of completion: September 15, 1910.

Contractor: R. J. Stoner.
Character of work: Furnishing 2,500 cords of brush fascines.
Price: $4 per cord.
Date of contract: July 6, 1910.
Date of commencement; July 26, 1910.
Date of completion: November 26, 1910.

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[1] Not printed.

Contractors: Ela & Kinnear.
Character of work: Furnishing and delivering 2,500 cords of brush fascines.
Price: $3.67 per cord of 128 cubic feet.
Date of contract: April 15, 1911.
Date of commencement: May 15, 1911.
Date of completion: August 15, 1911.

Contractor: Little Rock Lumber Co.
Character of work: Furnishing and delivering 77,725 linear feet fir piling.
Price: 15½ cents per linear foot.
Date of contract: April 15, 1911.
Date of commencement: May 25, 1911.
Date of completion: August 31, 1911.

Contractor: A. A. Tibbetts.
Character of work: Furnishing and delivering 3,000 grillage poles 20 feet long.
Price: 34 cents per pole.
Date of contract: April 15, 1911.
Date of commencement: May 15, 1911.
Date of completion: August 1, 1911.

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902 (p. 324, H. Doc. No. 421, 57th Cong., 2d sess.)	$1,000,000.00
Mar. 3, 1905	30,000.00
Mar. 2, 1907	200,000.00
May 27, 1908	300,000.00
Mar. 3, 1909	100,000.00
June 25, 1910	75,000.00
Feb. 27, 1911	300,000.00
	2,005,000.00
Received from sales	83.10
Total	2,005,083.10

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Brick	1,475,000 pieces	2,950	$53,100
Box shooks	918,200 pieces	5,513	99,328
Cement		9,500	123,000
Clams:			
Fresh		169	6,752
Canned		25	6,084
Fish, fresh		2,187	119,327
Lath	113,624,352 pieces	21,304	170,436
Lumber	343,060,452 feet b. m	514,620	4,116,965
Merchandise		6,587	658,700
Sand and gravel	58,830 cubic yards	79,420	71,478
Shingles	297,540,100 pieces	27,790	505,818
Sugar		451	51,414
Vegetables and fruit		820	34,350
Total		671,336	6,016,752

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $655,000

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[1] Exclusive of the balance unexpended July 1, 1911.

V V 3.

IMPROVEMENT OF GRAYS HARBOR (INNER PORTION) BETWEEN ABERDEEN AND THE ENTRANCE TO SAID HARBOR, AND CHEHALIS RIVER, WASH.

Operations with the Government dredge *Oregon* were continued until October 6, 1910.

From July 1 to August 10, 1910, the dredge operated below Cosmopolis in widening the channel to project dimensions of 200 feet in width and 18 feet depth at mean lower low water, and the total quantity of material removed was 133,852 cubic yards, at a cost of $0.0645 per cubic yard. The total length of channel below Cosmopolis covered by these operations was 9,000 feet.

From August 10 to October 6, 1910, dredging was done in the Chehalis River above Cosmopolis, and a channel 7½ feet deep was provided between Cosmopolis and Montesano. The total length of channel covered by the dredge was 16,800 feet, and the total quantity of material removed was 64,000 cubic yards, at a cost of $0.0645 per cubic yard.

Snagging was done during the month of September, 1910, with hired plant, at a cost of $500.

Soundings made in January, 1911, indicate no deterioration of channel depths in the Chehalis River above Cosmopolis. Soundings were made in May, 1911, below Cosmopolis and some shoaling of the dredged channel below Hoquiam was found. The dredge *Oregon* was returned to the Portland (Oreg.) district on October 22, 1910.

Inner Grays Harbor and Chehalis River are considered worthy of improvement by the General Government to the extent of maintaining the depths contemplated by the existing project.

APPROPRIATIONS.

GRAYS HARBOR (INNER PORTION) BETWEEN ABERDEEN AND THE ENTRANCE TO SAID HARBOR AND CHEHALIS RIVER, WASH.

Total appropriations to Dec. 31, 1902 (p. 324, H. Doc. No. 421, 57th Cong., 2d sess.)	$125,000.00
Act of Mar. 3, 1905	30,000.00
Act of Mar. 2, 1907	177,000.00
Act of Mar. 3, 1909 (allotment Apr. 23, 1909)	25,000.00
Act of June 25, 1910	32,500.00
Received from sales	30.05
Total	389,530.05

IMPROVEMENT OF CHEHALIS RIVER, WASH.

Total appropriations to Dec. 31, 1902 (p. 324, H. Doc. No. 421, 57th Cong., 2d sess.)	$19,000.00
Feb. 27, 1911	10,000.00
Total	29,000.00

COMMERCIAL STATISTICS, 1910.

GRAYS HARBOR AND CHEHALIS RIVER.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Brick	38,000 pieces	82	$380
Butter		61	30,500
Cement		278	2,780
Coal		84	504
Eggs	133 cases	3	1,069
Fruit and vegetables		1,950	81,900
Fish and oysters		69	6,900
Grain, hay, and flour		327	9,357
Horses and cattle	34 head	25	1,700
Logs	479,639,916 feet b. m.	700,269	4,346,409
Lumber	192,000 feet b. m.	288	2,304
Milk	182,000 gallons	728	25,480
Miscellaneous merchandise		1,101	110,100
Sand and gravel	58,830 cubic yards	79,420	71,478
Shingles	916,000 pieces	87	1,640
Total		748,772	4,692,500

V V 4.

IMPROVEMENT OF PUGET SOUND AND ITS TRIBUTARY WATERS, WASH.

The snag boat was in commission the entire year, except for eight days, during which repairs were made.

Snagging operations were carried on in the Skagit, North Fork of Skagit, Snohomish, Stillaguamish, and Nooksak Rivers, in Hat Slough, Ebey Slough, and Everett Harbor.

Dredging was done in the Skagit and Stillaguamish Rivers and at Fort Worden. At Fort Worden 6,690 cubic yards of material for back fill in Battery Kinzie was dredged from the adjacent waters.

In the Skagit River 20,281 cubic yards of material were dredged at three localities. In the Stillaguamish River 3,733 cubic yards were dredged at two localities.

The average width of channels dredged was 45 feet, and the average depth 3.4 feet. The total length of channels dredged was 5,535 feet.

The work covered by the project for improving Puget Sound and tributary waters is considered worthy of continuance by the General Government.

CONTRACT IN FORCE.

Emergency:

Contractor: C. E. Lund.

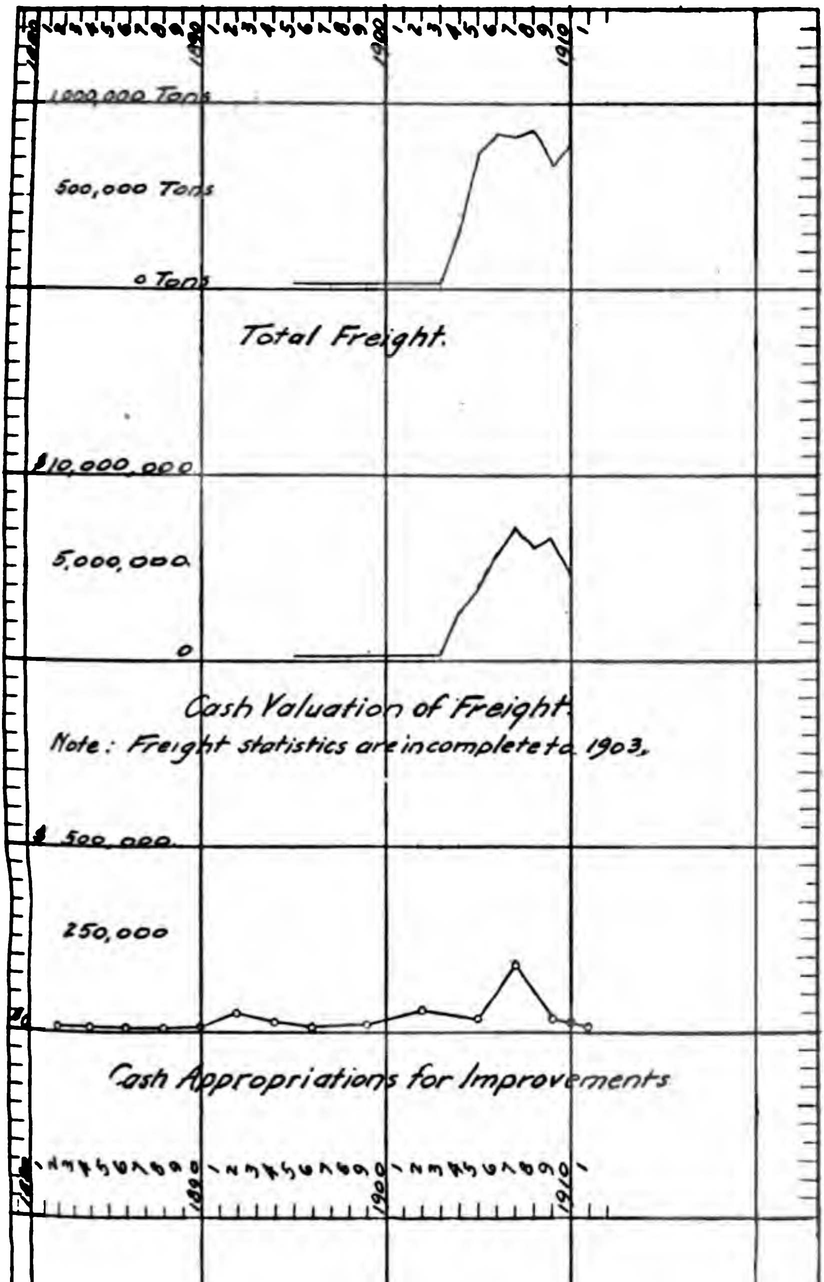
Character of work: Construction of mattress sill and shore protection.

Prices: Piles, $7 each; brush fascines, $5.50 per cord; transporting and placing stone, $1.10 per ton; wire, 3½ cents per pound.

Date of contract: August 23, 1910.

Date of commencement: August 29, 1910.

Date of completion, October 1, 1910.



Note: Freight statistics are incomplete to 1903.

GRAYS HARBOR - INNER PORTION - AND CHEHALIS RIVER, WASHINGTON.

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902 (p. 325 H. Doc. No. 421, 57th Cong., 2d sess.)	$228,500.00
Allotment June 4, 1904 (act Apr. 28, 1904)	12,000.00
Act of Mar. 3, 1905	20,000.00
Act of Mar. 3, 1905 (allotment Dec. 17, 1906)	4,500.00
Act of Mar. 2, 1907	75,000.00
Act of Mar. 3, 1909 (allotment Apr. 10, 1909)	25,000.00
Act of June 25, 1910	100,000.00
Act of Feb. 27, 1911	20,000.00
Received from sales	4,431.80
Total	489,431.80

COMMERCIAL STATISTICS, 1910.

STILLAGUAMISH RIVER.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Fruits and vegetables		447	$29,325
Hay		649	10,384
Logs	20,837,662 feet, b. m	31,255	187,503
Lumber	2,000,000 feet, b. m	3,000	26,000
Merchandise, general		3,678	357,512
Oats		1,324	39,720
Shingles	2,183,000 pieces	99	4,366
Shingle bolts	7,200 cords	7,200	18,000
Total		47,652	672,810

NOTE.—The tonnage of oats shows a decrease from the year 1909. This is accounted for by the fact that a large part of last year's crop is still in the farmer's warehouses.

SNOQUALMIE RIVER.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Logs	65,000,000 feet, b. m	97,500	$585,000
Milk, fresh		2,670	93,450
Piling and poles	950,000 linear feet	35,625	66,500
Total		135,795	744,950

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $25,000

V V 5.

IMPROVEMENT OF HARBOR AT OLYMPIA, WASH.

With funds provided by the act of June 25, 1910, and the balance available from the act of June 13, 1902, dredging was commenced under contract on January 12, 1911, on the west side of Olympia Harbor, in accordance with the extended project.

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[1] Exclusive of the balance unexpended July 1, 1911.

With the available funds a channel 13 feet deep at mean lower low water extending from deep water southward for a distance of 5,250 feet was secured. The channel width is 100 feet for a distance of 4,450 feet and 170 feet in width for a distance of 800 feet at the southern end.

The dredged material was deposited behind bulkheads adjacent to the dredged channel. These bulkheads and the places of deposit were provided by local interests in compliance with the conditions of the act of June 25, 1910.

By authority of the department the direction of the channel was changed to make it parallel with the pier head line from the West Side Waterway northward throughout its entire length.

With the additional funds provided by the act of March 27, 1911, it is proposed to excavate the west side channel and turning basin to project dimensions, when local interests have complied with the conditions relative to construction of bulkheads and providing suitable places of deposit for the excavated material. This has not been done.

The improvement of Olympia Harbor is considered worthy to the extent covered by the project adopted by the act of June 25, 1910.

APPROPRIATIONS.

July 13, 1892	$35,000
Aug. 18, 1894	40,000
June 3, 1896	32,000
Mar. 3, 1899	15,000
June 13, 1902	25,000
June 25, 1910	15,000
Feb. 27, 1911	43,000
Total	205,000

CONTRACT IN FORCE.

Emergency:
Contractor: Puget Sound Bridge & Dredging Co.
Character of work: Dredging 200,000 cubic yards of material.
Price: $10\frac{5}{10}$ cents per cubic yard.
Date of contract: October 19, 1910.
Date of commencement: December 17, 1910.
Date of completion: February 15, 1911.
Time limit waived and work completed March 11, 1911.

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Logs	14,567,420 feet b. m	21,850	$116,546
Lumber	322,870 feet b. m	483	4,000
Fruit		200	10.000
Oysters and fish		1,500	154.800
Miscellaneous merchandise		20	12,000
Shingle bolts		2,000	8,000
Coal		1,000	5,000
Sand and gravel		4,000	2,000
Total		31,053	212,346

V V 6.

IMPROVING HAMMERSLEY INLET, WASH.

The contract was made for dredging. Owing to an accident to the contractor's plant operations were not commenced until May 18, 1911. Work is now in progress at Cape Horn Bar. On account of swift tidal currents dredging can be done only during portions of each day and the progress has been slow. During the year 5 per cent of the work was done.

CONTRACT IN FORCE.

Emergency:
Contractor: Tacoma Dredging Co.
Character of work: Dredging 162,000 cubic yards.
Date of contract: October 31, 1910.
Date of commencement: December 26, 1910.
Date of completion: February 24, 1911.
Time limit waived for a reasonable period.

APPROPRIATION.

June 25, 1910	$9,000

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Agricultural implements		36	$1,800
Beer		373	23,872
Butter		26	15,600
Fish and oysters		437	65,550
Flour		284	14,200
Fruit:			
Fresh		222	11,100
Canned		116	15,428
Hay and grain		1,222	32,244
Hardware		860	172,000
Hides		37	7,400
Live stock		64	8,722
Lumber	90,720 feet b. m	117	2,467
Logs	119,244,780 feet b. m	178,866	1,013,580
Machinery		1,928	385.600
Milk, canned		76	9,442
Miscellaneous		704	93,176
Piling and poles		8,957	14.332
Sugar		169	18,590
Tobacco		45	45,000
Vegetables		100	3,370
Total		194,639	1,953.478

Two steamers of 138 and 168 registered tons, respectively, made 726 trips during the year, carrying 34,307 passengers to and from Shelton.

V V 7.

IMPROVEMENT OF TACOMA HARBOR, WASH.

PUYALLUP WATERWAY.

There were no operations during the year.

The expenditures made were for inspections.

The Puyallup waterway is considered unworthy of further improvement by the General Government unless the river is first diverted or the project otherwise modified.

APPROPRIATIONS.

CITY WATERWAY.

June 13, 1902	$75,000.00
Mar. 3, 1903	100,000.00
Total	175,000.00

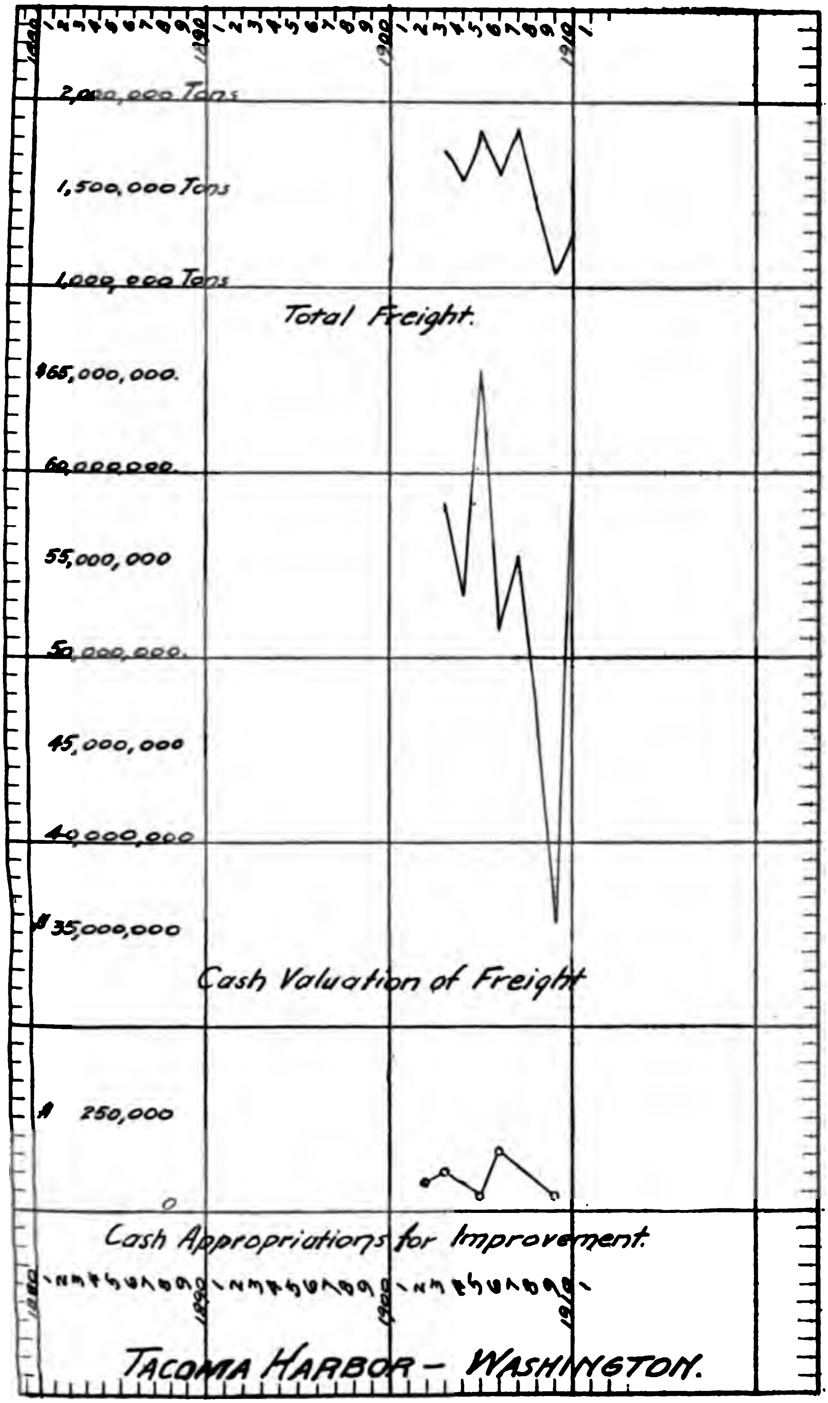
PUYALLUP WATERWAY.

Mar. 3, 1905	$40,000.00
June 30, 1906	160,000.00
Mar. 4, 1909	40,000.00
Received from sales	.40
Total	240,000.40

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Agricultural implements		1,672	$138,816
Asphalt		2,954	55,332
Beer		546	13,104
Box shooks		3,673	110,190
Brick	2,020,000 pieces	4,545	44,906
Butter		156	105,200
Cement		34,040	347,230
Coal		49,565	151,292
Cotton		6,103	1,707,325
Eggs	3,022 crates	68	24,683
Fish and oysters		15,850	908,958
Flour		125,589	5,084,121
Fruit		4,918	497,400
Grain		137,412	4,656,344
Grain bags and gunnies		6,800	875,380
Gypsum rock		33,452	97,070
Hay		19,747	271,730
Hemp		5,368	536,800
Hides		25	1,946
Lath	15,348,400 pieces	3,064	22,702
Lime and lime rock		45,558	322,721
Live stock		387	58,060
Logs	113,570,770 feet b. m.	170,454	1,075,061
Lumber	154,650,400 feet b. m.	233,973	2,012,232
Machinery		21,388	1,911,940
Marble		3,005	52,084
Meats		1,230	249,600
Merchandise		132,755	17,797,018
Miscellaneous		5,603	686,955
Oil		60,778	528,728
Ore		100,393	4,593,354
Pig iron		3,290	82,100
Plaster		9,319	93,304
Products of smelter		14,676	6,343,520
Sand and gravel		29,429	16,394
Shingles	6,425,500 pieces	610	12,130
Silk		1,566	7,282,850
Sugar		4,333	476,640
Tea		4,912	2,669,232
Total		1,299,206	61,316,442

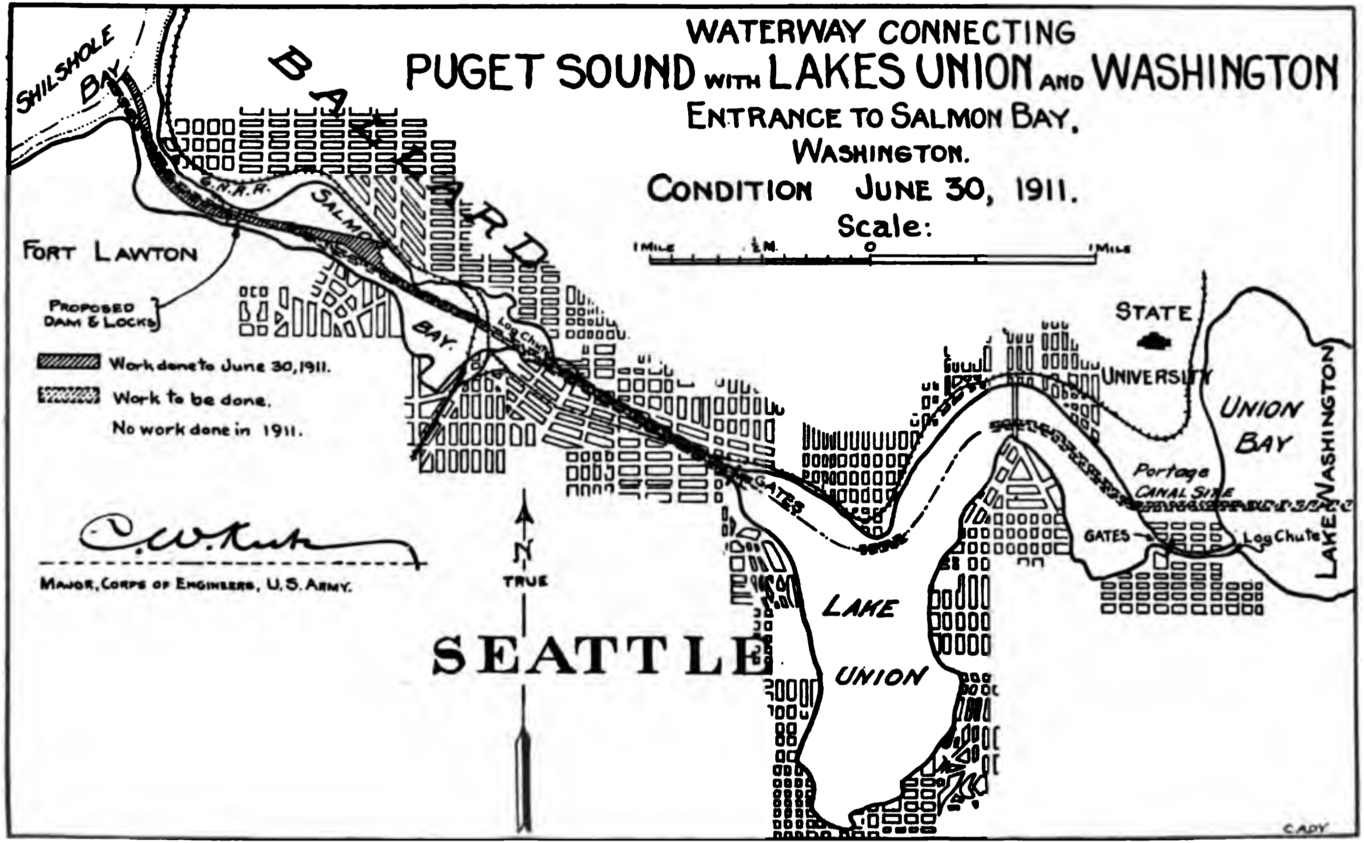


Total Freight.

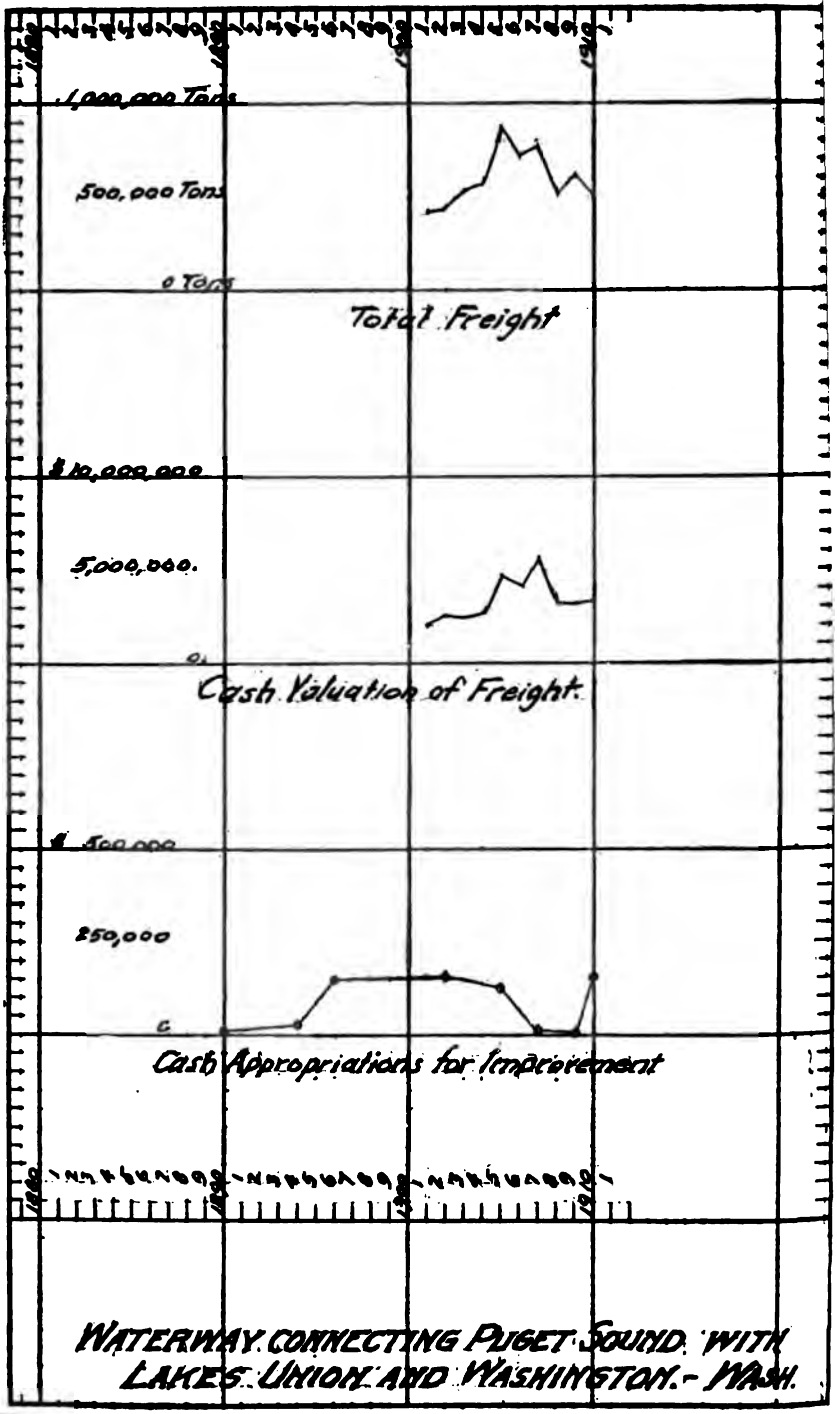
Cash Valuation of Freight

Cash Appropriations for Improvement.

TACOMA HARBOR – WASHINGTON.


WATERWAY CONNECTING
PUGET SOUND WITH LAKES UNION AND WASHINGTON
ENTRANCE TO SALMON BAY,
WASHINGTON.
CONDITION JUNE 30, 1911.
Scale:
1 MILE
½ M.
0
1 MILE
SHILSHOLE BAY
BALLARD
G.N.R.R.
SALMON BAY
FORT LAWTON
PROPOSED DAM & LOCKS
Work done to June 30, 1911.
Work to be done.
No work done in 1911.
Log Chute
GATES
N
TRUE
SEATTLE
LAKE UNION
STATE UNIVERSITY
UNION BAY
Portage
CANAL SITE
GATES
Log Chute
LAKE WASHINGTON
C. W. Kutz
MAJOR, CORPS OF ENGINEERS, U.S. ARMY.
CADY

2635-1



WATERWAY CONNECTING PUGET SOUND WITH LAKES UNION AND WASHINGTON.-WASH.

V V 8.

IMPROVEMENT OF WATERWAY CONNECTING PUGET SOUND WITH LAKES UNION AND WASHINGTON.

During the year the right of way and controlling gates have been cared for. Borings have been made at the lock site and plans and specifications for the cofferdam and lock excavation are completed. Plans, in detail, of the lock and its appurtenances are being prepared.

The work of excavating the canal above the lock is being prosecuted under the direction of this office with funds provided by local interests (act of Congress approved June 25, 1910). C. J. Erickson has completed a contract dated August 7, 1909, for the excavation of 161,917 cubic yards from the section between the two lakes at $0.35 per cubic yard. A contract with Holt & Jeffrey, dated March 22, 1911, calls for the removal of 243,000 cubic yards from the section between Lake Union and the lock at $0.30 per cubic yard; 15,860 cubic yards have been removed.

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902 (p. 325, H. Doc. No. 421, 57th Cong., 2d sess.)	$335,000.00
Mar. 3, 1905	125,000.00
Mar. 2, 1907	10,000.00
Act of Mar. 3, 1909 (allotment of Apr. 23, 1909)	5,000.00
Act of June 25, 1910	155,000.00
Act of Feb. 27, 1911	150,000.00
Received from sales	2.95
Total	780,002.95

COMMERCIAL STATISTICS, 1910.

Freight traffic.

LAKE WASHINGTON.

Articles.	Amount.	Short tons.	Value.
Coal		6,385	$25,540
Hardware and building material		584	11,486
Hay and grain		519	10,093
Gravel and sand	22,482 cubic yards	30,350	10,117
Fruit		35	1,400
Lath	2,800,000 pieces	525	4,200
Live stock		49	2,250
Logs	79,625,947 feet b. m	119,437	676,634
Lumber	9,876,512 feet b. m	14,813	148,727
Milk		104	3,640
Merchandise		316	31,600
Oil, fuel	24,754 barrels	4,945	25,973
Poles and piling	45,040 linear feet	1,688	3,153
Shingles	660,000 pieces	594	1,236
Shingle bolts	5,258 cords	5,258	9,980
Vegetables		154	3,080
Wood	2,075 cords	2,075	6,225
Total		187,831	975,334

SALMON BAY-BALLARD.

Articles.	Amount.	Short tons.	Value.
Lath	637,000 pieces	125	$1,402
Logs	163,956,000 feet b. m	245,934	1,705,339
Lumber	50,437,000 feet b. m	75,655	610,643
Miscellaneous		1,350	56,700
Shingles	1,875,000 pieces	1,688	3,375
Shingle bolts	3,400 cords	3,400	11,900
Total		328,152	2,389,359

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $750,000

V V 9.

IMPROVING SNOHOMISH RIVER, WASH.

There were no operations during the year. On account of the small amount appropriated by the act of June 25, 1910, work was deferred until additional funds had been provided.

The act of February 27, 1911, appropriated $75,000 and provided for completion of the work under continuing-contract system.

Specifications have been prepared and approved. Bids for dredging and for dike construction and repair will be received early in the next fiscal year.

APPROPRIATIONS.

June 25, 1910	$25,000
Mar. 27, 1911	75,000
	100,000

COMMERCIAL STATISTICS, 1910.

Freight traffic.

SNOHOMISH RIVER AND EVERETT HARBOR.

Articles.	Amount.	Short tons.	Value.
Beer	1,000 barrels	250	$8,000
Brick	614,500 pieces	1,235	6,145
Box shooks	300,000 feet b. m	450	3,285
Cement and lime		1,070	12,540
Coal		2,500	15,000
Flour, grain, and feed		4,600	100,625
Fruit and vegetables		3,465	108,500
Iron (scrap and pig)		4,700	101,260
Lath	34,600,000 pieces	6,469	51,900
Lime rock and clay		8,011	38,337
Live stock		75	7,800
Logs	437,080,116 feet b. m	655,620	4,166,855
Lumber	51,217,756 feet b. m	76,885	656,372
Machinery		2,632	443,047
Miscellaneous merchandise		16,749	1,674,900
Oil		460	9,200
Paper		6,200	538,500
Piling and poles	1,835,219 linear feet	68,820	166,069
Sand and gravel	24,000 cubic yards	32,000	10,800
Shingles	16,200,000 pieces	1,539	29,160
Shingle bolts	16,000 cords	16,000	40,000
Soda		615	13,000
Sugar		1,500	28,600
Wood pulp		160	7 250
Total		912,005	8,237,135

The amount of commerce originating in the Snohomish River and tributaries from above the city limits of Everett consisted of:

Logs	feet b. m.	171,494,970
Piling and poles	linear feet.	1,185,000
Shingle bolts	cords.	10,000

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[1] Exclusive of the balance unexpended July 1, 1911.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $180,000

V V 10.

IMPROVING SKAGIT RIVER, WASH.

Work under contract was commenced on November 25, 1910, and is in progress at the close of the year.

The mattress sill in North Fork of Skagit River was repaired, a mattress sill in Old Main River near Fir and three closing dikes were constructed. The training dike has been built for a distance of 8,100 feet.

During the year a slight change in the direction of the outer end of the main dike was authorized and its total length reduced. Notwithstanding this reduction in length it is questionable whether the dike can be completed with the funds available, as the scour around the end has been much larger than was anticipated, necessitating the use of increased quantities of brush and stone. There has also been considerable settlement in the mattress sills since completion and in completed portions of the dike. About $6,000 has already been spent in repair and reconstruction work and considerable additional work of this character will be necessary, for which an estimate of $15,000 is submitted.

The following table gives the quantities of material received and placed in each work during the year:

Locations.	Brush.	Piling.	Stone.	Lumber.	Spikes.	Wire.
	Cords.	*Lin. feet.*	*Tons.*	*Feet b. m.*	*Pounds.*	*Pounds.*
North Fork	137.4	....	825.21	....	....	426
Old Main Channel	400.3	1,681	1,708.16	....	....	1,965
Dike No. 1	62.8	508	309.02	1,222	80	450
Dike No. 2	253.8	1,424	2,797.41	2,768	257	1,016
Dike No. 3	80.6	1,271	559.53	3,274	369	374
Dike No. 3-A	63.8	....	143.08	....	....	324
Training dike	4,390.7	67,232	15,822.62	52,340	3,246	19,030
Total	5,389.4	72,116	22,165.03	59,604	3,952	23,584

CONTRACT IN FORCE.

Contractor: International Dredging Co.

Character of work: Construction and repair of dikes and sills.

Prices: Brush, $4.25 per cord; piling, $13\frac{6}{10}$ cents per linear foot; stone, $1.48 per ton of 2,000 pounds; lumber, $15.50 per 1,000 feet b. m.; spikes, 4 cents per pound; wire, 3 cents per pound.

Date of contract: October 20, 1910.

Date of approval: November 22, 1910.

Date of commencement: November 29, 1910.

Date of completion: January 1 and October 31, 1911.

APPROPRIATION.

June 25, 1910	$100,000

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[1] Exclusive of the balance unexpended July 1, 1911.

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Cement and brick		621	$7,373
Farm produce		520	29,422
Fish, fresh		3	225
Flour, grain, etc		4,258	136,230
Fruit, canned		121	12,040
Hay		1,774	28,384
Live stock		520	41,720
Logs	117,664,845 feet b. m.	176,497	1,079,817
Lumber	50,000 feet b. m.	75	550
Machinery		1,022	134,416
Milk, fresh		1,796	62,860
Milk, condensed		10,434	1,316,511
Miscellaneous merchandise		8,591	838,255
Oil, fuel		2,682	15,327
Piling	7,000 linear feet	262	560
Shingles	6,191,000 pieces	588	12,388
Wood	800 cords	800	2,800
Total		210,564	3,718,878

NOTE.—The grain tonnage shows a decrease over last year, which is accounted for by the fact that a large part of last year's crops are still in the farmer's warehouses.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement.......[1]$15,000

V V II.

IMPROVEMENT OF SWINOMISH SLOUGH, WASH.

There were no operations nor expenditures during the year.

Swinomish Slough is considered worthy of improvement by the General Government to the extent of maintaining a channel 4 feet deep at lower low water from Saratoga Passage to La Conner.

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902 (p. 325, H. Doc. No. 421, 57th Cong., 2d sess.)	$125,000
Mar. 3, 1905	5,000
Mar. 2, 1907	75,000
Act of Mar. 3, 1909 (allotment of June 26, 1909)	10,000
June 25, 1910	10,000
Total	225,000

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Fish, fresh		10,200	$52,300
Hay		7,000	112,000
Logs	1,400,000 feet b. m.	2,100	11,900
Lumber	625,000 feet b. m.	937	8,125
Merchandise, general		7,210	721,000
Oats		17,500	455,000
Total		44,947	1,360,325

NOTE.—The tonnage of oats shows a decrease from the year 1909. This is accounted for by the fact that a large part of last year's crop is still in the farmers' warehouses.

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[1] Exclusive of the balance unexpended July 1, 1911.

V V 12.

IMPROVEMENT OF BELLINGHAM HARBOR, WASH.

There have been no operations during the past fiscal year and no expenditures were made.

Previous operations at Bellingham Bay were carried on under the appropriation title "Improving harbor at New Whatcom, Wash."

The amount appropriated by the act of June 25, 1910, was insufficient to secure beneficial results.

The act of March 27, 1911, provided additional funds and authorized a continuing contract for completion of the work.

Specifications for dredging have been prepared and approved and bids will be invited when the conditions relative to cooperation by local interests have been completed.

APPROPRIATIONS.

June 13, 1902	$25,000
Mar. 3, 1905	35,000
June 25, 1910	15,000
Feb. 27, 1911	25,000
Total	100,000

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Agricultural implements		140	$14,000
Beer		150	3,600
Brick	145,000	290	1,450
Box shooks		2,800	640,000
Cement		610	7,320
Coal		6,931	20,793
Dairy and farm products		1,952	294,500
Fruit, canned		4,450	356,000
Fish:			
Fresh		5,636	281,100
Canned		16,032	801,600
Flour, feed, hay, and grain		1,866	65,721
Hardware and building material		15,125	9,950
Hides		200	
Logs	129,033,573 feet b. m	193,550	1,028,264
Lath	5,139,800 pieces	1,297	7,709
Live stock		325	32,600
Lime		801	12,015
Poles	2,770 linear feet	105	200
Lumber	48,395,434 feet b. m	72,592	483,950
Miscellaneous merchandise		27,476	2,750,000
Machinery		525	52,500
Sugar		1,380	151,800
Shingle bolts and wood		3,700	11,100
Pickets	181,913 pieces	271	2,000
Total		358,204	7,028,072

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $52,250

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[1] Exclusive of the balance unexpended July 1, 1911.

V V 13.

IMPROVEMENT OF COLUMBIA RIVER BETWEEN WENATCHEE AND BRIDGEPORT, WASH.

Work was carried on at Entiat Rapids, mouth of Wenatchee River, and at Rocky Reach during the low-water period.

At Entiat Rapids the middle channel was dredged by use of a Bagley scraper and hoisting engine located on an island. The work was suspended on account of high water before it was completed. About 40 per cent of the channel was dredged to a low-water depth of 2 feet and 100 feet wide. The quantity of material removed was 15,080 cubic yards.

At the mouth of Wenatchee River one large rock was removed by blasting.

About 2,000 feet below Entiat Rapids one large rock, known as "Pringle Rock," was removed.

At Rocky Reach the obstructions to navigation consisted of rocks and rock reefs. These were removed and several large rocks along the shore were broken up.

The Columbia River between Wenatchee and Bridgeport is considered worthy of improvement to the extent covered by the existing project.

APPROPRIATIONS.

Act of Mar. 2, 1907	$42,000.00
Act of June 25, 1910	25,000.00
Received from sales	2.50
Total	67,002.50

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Short tons.	Value.
Flour, wheat, feed, etc	4,359	$130,770
Coal	690	5,500
Fruit	5,738	286,900
Furniture	395	39,500
Hardware	2,514	251,000
Implements	1,538	317,600
Live stock	2,380	119,000
Miscellaneous merchandise	8,500	675,000
Total	26,114	1,825,270

V V 14.

IMPROVING COLUMBIA RIVER BETWEEN BRIDGEPORT AND KETTLE FALLS, WASH.

The plant, consisting of a stern-wheel steamboat, owned and operated by the State of Washington, was turned over to the United States for use on this work. The vessel was in poor condition when received.

Three drill scows, each equipped with three steam drills and one horizontal boiler, were constructed. Quarters for the crew were provided on each scow. The stage of water was unfavorable for conducting operations by the time the plant was completed and only a small amount of work was done by the steamer *Yakima* at Foster Creek Rapids during the year.

By authority of department indorsement of February 21, 1911, an examination of Grand or Rickey Rapids was made and the following is an extract from a report thereon by Mr. H. J. M. Baker, junior engineer:

Pursuant to your verbal instructions of May 31, 1911, I made an inspection of Grand, or Rickey Rapids, near Kettle Falls, located on the Columbia River, on June 1, 1911, and have the honor to report as follows:

The Wenatchee stage of the river on the date of inspection was 28.3 feet, and the water at Grand Rapids was 16 feet higher than at the previous inspection on March 19.

At the present stage all reefs and islands along the left bank and in the central portion of the river are submerged except the large round island near the left bank.

The greatest fall of the rapids occurs at the same place and has much the same appearance as at the low stage of water. The fall, however, is distributed over a somewhat greater length and over the entire width of the river.

At the present stage a boat may steam up the rapids to the large round island with little difficulty, and may be lined to within a short distance of the point of greatest fall by passing between the round island and the left bank.

The most feasible method that presents itself of improving the river at this point, without the use of locks, is the construction of a channel in the rock bench along the left bank.

This channel must be of sufficient length to reduce the velocity of the water so that boats may be lined past the obstruction.

The upper part of the rapids presents no serious difficulty in the way of improvement, requiring the removal of but a comparatively small amount of rock in order to be made navigable at all but extreme low-water stages.

The drop or fall to be overcome is 7 feet at low water and 5 feet at the present stage. Assuming a channel with a bottom width of 50 feet, with side slopes of 1 on 1, and a depth of water of 5 feet, we would have:

Area of section of water	275
Wetted perimiter	64. 2
Hydraulic radius	$\frac{275}{64.2}=4.3$

Using a value of n=.030 we find the drop per 1,000 feet necessary to produce certain velocities to be as per the following table:

Velocity per hour.	Velocity per second.	Slope per 1,000.	Length of canal to overcome 6-foot fall.
Miles.	*Feet.*	*Feet.*	*Feet.*
3	4	1°	6,000
4	6	2°	3,000
5	7	3°	2,000
6	9	5°	1,200
7	10	6. 5°	930
8	12	9°	670
9	13	11°	550
10	15	14°	430
11	16	16°	375
12	18	21°	290

At the upper end of Entiat Rapids, over which the Columbia & Okanogan Co. boats line daily, the velocity as indicated on the maps in this office is 10.7 miles per hour.

In order that the velocity in the proposed channel at Grand Rapids shall not exceed 10 miles per hour, the channel must necessarily be 430 feet long.

Placing the bottom of the channel at the 1911 low-water elevation of the lower pool, and assuming a level bottom, there results from computation approximately 8,000 cubic yards of rock to be removed.

If it is assumed that an equal quantity of rock must be removed from the remaining portion of the rapids, the total is 16,000 cubic yards.

16,000 cubic yards, at $2.50	$40,000
20 per cent	8,000
	48,000

In round numbers, $50,000.

With the bottom of the channel at the elevation of the lower pool, an 8-foot stage would be required at Wenatchee in order to provide 4½ feet of water through the channel.

The following table shows the dates between which the river was at or above the 8-foot stage:

1905: April 22 to October 31.
1906: April 6 to October 16.
1907: April 10 to October 31.
1908: April 16 to October 9.
1909: April 26 to October 22.
Mean: April 16 to October 22, or six months.

From this report it appears that a channel 50 feet wide, with velocities of 10 miles per hour and available for use six months each year, can be provided for $50,000. Such a channel would be of very doubtful benefit to commerce, as vessels would have to line through in both directions and any failure of the line would almost certainly lead to the destruction of the boat. A channel of greater width or less slope would be safer and would cost proportionately more.

Based upon examinations made by Assistant Engineer Ricksecker (since deceased) and Junior Engineer Baker at varying stages of water and upon a personal examination made at low stage, the conclusion is reached that the only adequate method of making these rapids navigable is to canalize them.

The amount of commerce that would pass through Grand Rapids if improved is a matter of conjecture, but it is believed that it would not exceed from 3,000 to 5,000 tons, as the country is thinly populated.

An extension of the project to include these rapids is not recommended.

The appropriation recommended will be required to continue work covered by the existing project. The estimated cost of the work was $175,000, which includes the sum of $75,000 for plant. The act of June 25, 1910, appropriated the sum of $100,000, with the provision that the plant owned and operated by the State of Washington on this section of the river be turned over to the United States. The plant referred to consists of a stern-wheel steamboat in very poor condition. The value of the vessel when purchased by the State of Washington was $15,000. To make this vessel serviceable will require an expenditure of not less than $5,000.

To successfully carry on the work, it was necessary to provide additional plant, and three drill scows have been built and equipped at a cost of $35,000.

The balance available will not be sufficient to accomplish the work outlined in the project, and the additional appropriation of $50,000 is therefore recommended for continuing the work.

This part of the Columbia River is considered worthy of improvement by the General Government to the extent covered by the project adopted by the act of June 25, 1910.

APPROPRIATION.

June 25, 1910	$100,000.00
Received from sales	3.15
	100,003.15

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] $50,000

V V 15.

IMPROVEMENT OF OKANOGAN AND PEND OREILLE RIVERS, WASH.

(A) OKANOGAN RIVER.

No work was done on the Okanogan River during the year.

The value of existing commerce carried on this river is not commensurate with the probable cost of securing and maintaining navigable depths at low water.

Traffic on this river is limited to a short high-water period of approximately six weeks each year, and the depths during that period are sufficient for existing commercial needs. Railroad lines to tap the territory tributary to the stretch of the Okanogan River covered by the existing project are under consideration or proposed, and for these reasons the Okanogan River is not considered worthy of further improvement or maintenance by the General Government.

(B) PEND ORIELLE RIVER.

Owing to unsatisfactory progress made by the contractor and a doubt as to the benefits to be derived or the necessity for further improvement of the Pend Orielle River between Newport and Box Canyon, the contract was annulled on April 14, 1910. Since the work of improvement under the contract of August 21, 1908, was commenced a railroad has been built along the left bank of the river from Newport to Ione, about 9 miles below Yakima bar, where dredging under the Beckman contract was terminated, and 3 miles above Box Canyon. Boat service on this part of the river was discontinued as the railroad construction advanced, the river traffic, with the exception of the towage of logs and poles, was absorbed by the railroad, and the depths in the navigable channels are sufficient for the class of vessels employed in existing or prospective traffic.

For the above-mentioned reasons the Pend Orielle River between Newport and Box Canyon is not considered worthy of further improvement by the General Government.

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[1] Exclusive of the balance unexpended July 1, 1911.

APPROPRIATIONS.

Total appropriations to Dec. 31, 1902 (H. Doc. No. 421, 57th Cong., 2d sess., p. 325)	$47,500.00
Mar. 3, 1905	15,000.00
Mar. 2, 1907	20,000.00
Received from sales	.60
Total	82,500.60

COMMERCIAL STATISTICS, 1910.

Freight traffic.

OKANOGAN RIVER.

Articles.	Short tons.	Value.
Agricultural implements and machinery	35	$700
Coal	43	387
Furniture	43	4,300
Hardware	100	10,000
Lumber, shingles, and doors	106	2,650
Miscellaneous merchandise	1,011	102,000
Total	1,338	120,037

V V 16.

IMPROVING POLSON BAY, MONT.

The removal of bowlders to provide a channel 6 feet deep at low water and 100 feet wide, with a turning basin 500 feet by 600 feet at the inner end, was commenced with hired plant and labor on September 15, 1910, and completed on November 30, 1910. Approximately 1,800 bowlders and 1,000 cubic yards of mud were removed at a cost of $4,491.14.

The hired plant consisted of an orange-peel bucket dredge, two scows, with half hopper on each scow, and a small tug, the only plant available for the work.

The excavated channel and basin were marked with piles driven at the angle points.

APPROPRIATIONS.

June 25, 1910	$6,000

COMMERCIAL STATISTICS, 1910.

Freight traffic.

Articles.	Amount.	Short tons.	Value.
Miscellaneous merchandise		10,000	$1,000,000
Logs	40,000,000 feet b. m.	60,000	320,000
Total		70,000	1,320,000

V V 17.

IMPROVEMENT OF ST. MICHAEL CANAL, ALASKA.

With funds provided by the act of June 25, 1910, $143,000, a contract has been made for completing the project on a modified basis. The modified project contemplates the excavation of a channel 100 feet wide and 6 feet deep at mean low water from station A to station 11A and where necessary between station 11A and point B, also at two sharp bends between 11A and 28A, instead of excavating an expensive cut-off contemplated by the original project.

Under this contract work was commenced on July 13, 1910. Dredging was in progress until October 5, 1910, when all work was suspended for the season on account of ice. During the working season the dredge excavated a channel 100 feet wide and 6 feet deep at mean lower low water for a distance of 23,883 feet. The total quantity of material removed during the season of 1910 was 97,100 cubic yards. The excavated material was deposited on adjacent banks and in small lakes. This material consisted of hard and soft mud and a few rock bowlders.

Operations were resumed on June 20, 1911, and 760 cubic yards of material were excavated during this season.

St. Michael Canal is considered worthy of improvement by the General Government, as contemplated by the modified project adopted by the act of June 25, 1910.

APPROPRIATIONS.

Mar. 2, 1907	$98,000.00
May 27, 1908	150,000.00
June 25, 1910	143,000.00
Received from sales	1.55
Total	391,001.55

CONTRACT IN FORCE.

Emergency.
Name of contractor: Puget Sound Bridge & Dredging Co.
Character of work: Excavating channel; quantity of material to be removed, 130,000 cubic yards.
Price per unit: 90 cents per cubic yard, place measurement.
Date of contract: June 27, 1910.
Date of beginning work: July 1, 1911.
Date of expiration: November 1, 1911.

COMMERCIAL STATISTICS FOR THE PORT OF ST. MICHAEL, SEASON 1909.

[Compiled by the Northern Navigation Co., of San Francisco, from records of United States customhouse at St. Michael.]

IMPORTS.

Coal from ocean vessels, domestic	tons..	2,348
Fuel oil from ocean vessels, domestic	do....	3,485
Lumber from ocean vessels, domestic	do....	1,556
General merchandise from ocean vessels:		
Domestic	do....	29,385
Foreign	do....	785
Total	do....	37,559

Value of domestic cargoes from ocean vessels		$2, 846, 267
Value of foreign cargoes from ocean vessels		$42, 095
Cargoes from river boats	tons	111
Cargoes from coastwise vessels	do	44
Value of cargoes landed from river boats		$64, 935
Value of cargoes landed from coastwise vessels		$12, 250
Passengers landed from ocean vessels		645
Passengers landed from river steamers		1, 654
Gold dust and bullion landed from river boats		$589, 762
Arrivals, ocean vessels:		
Steamers		60
Sail		1
Total tonnage		101, 784
Arrivals:		
River steamers		41
River barges		55
Total tonnage		52, 698

EXPORTS.

General merchandise by ocean vessels (155 tons)		$77, 135
Gold dust and bullion by ocean vessels		$592, 103
Passengers sent out on ocean vessels		2, 293
Foreign goods shipped to foreign Yukon ports	tons	78
Domestic goods shipped to foreign Yukon ports	do	747
Fuel oil shipped to United States ports on Yukon River	do	3, 700
Domestic goods shipped to United States ports on Yukon, Tanana, and Koyukuk Rivers	tons	25, 396
Total tonnage to Tanana, Koyukuk, and Yukon River ports		29, 921
Passengers sent out on river boats		246
Value of foreign goods shipped to foreign Yukon ports		$2, 730
Value of domestic goods shipped to foreign Yukon ports		$117, 475
Value of domestic goods shipped to United States ports on Yukon, Tanana, and Koyukuk Rivers		$2, 333, 077
Departures:		
Ocean steamers		60
Sail vessels		1
Total tonnage		101, 784
River boats		43
Barges		71
Total tonnage		61, 187
Harbor boats and tugs		8
Harbor lighters and barges		22
Total tonnage of harbor vessels		8, 009

APPENDIX W W.

RIVER AND HARBOR IMPROVEMENTS IN THE DISTRICT OF HAWAII.

REPORT OF CAPT. A. B. PUTNAM, CORPS OF ENGINEERS, OFFICER IN CHARGE FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. Honolulu Harbor, Hawaii.
2. Hilo Harbor, Hawaii.
3. Kahului Harbor, Hawaii.

UNITED STATES ENGINEER OFFICE,
Honolulu, Hawaii, July 5, 1911.

SIR: I have the honor to submit herewith annual report upon the works of improvement under my charge for the fiscal year ending June 30, 1911.

Very respectfully,
A. B. PUTNAM,
Captain, Corps of Engineers.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

W W 1.

IMPROVEMENT OF HONOLULU HARBOR, HAWAII.

For history and description of the work done at this locality, see summary, page 1056.

A contract was entered into November 23, 1910, with the Hawaiian Dredging Co., of Honolulu, for dredging at the north end of the harbor, and on November 28, 1910, contract was entered into with the Standard American Dredging Co., of San Francisco, for redredging the entrance channel.

Under the first contract, 110,897 cubic yards of material were removed, of which 60,000 were placed on the Oahu Railroad property and 50,897 were placed on Quarantine Island.

No work was done under the second contract.

APPROPRIATIONS.

Mar. 3, 1905	$200,000.00
June 30, 1906	200,000.00
Mar. 2, 1907	200,000.00
May 27, 1908	200,000.00
Mar. 3, 1909 (allotted Dec. 16, 1909)	25,000.00
June 25, 1910	150,000.00
Total	975,000.00
Receipts from sales	14.50
Total	975,014.50

CONTRACTS IN FORCE.

Contractor: Hawaiian Dredging Co. (Ltd.).
Character of work: Dredging.
Amount of work: 162,000 cubic yards.
Rate: $0.77 per cubic yard, place measurement.
Date of approval: December 20, 1910.
Date of beginning work: February 3, 1911.
Date for completion: August 15, 1911.

Contractor: Standard American Dredging Co.
Character of work: Dredging.
Amount of work: 65,000 cubic yards.
Rate: 34¾ cents per cubic yard, place measurement.
Date of approval: January 16, 1911.
Date of beginning work: April 4, 1911. Extended to July 5, 1911.
Date of completion: August 15, 1911. Extended a reasonable time.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1910.

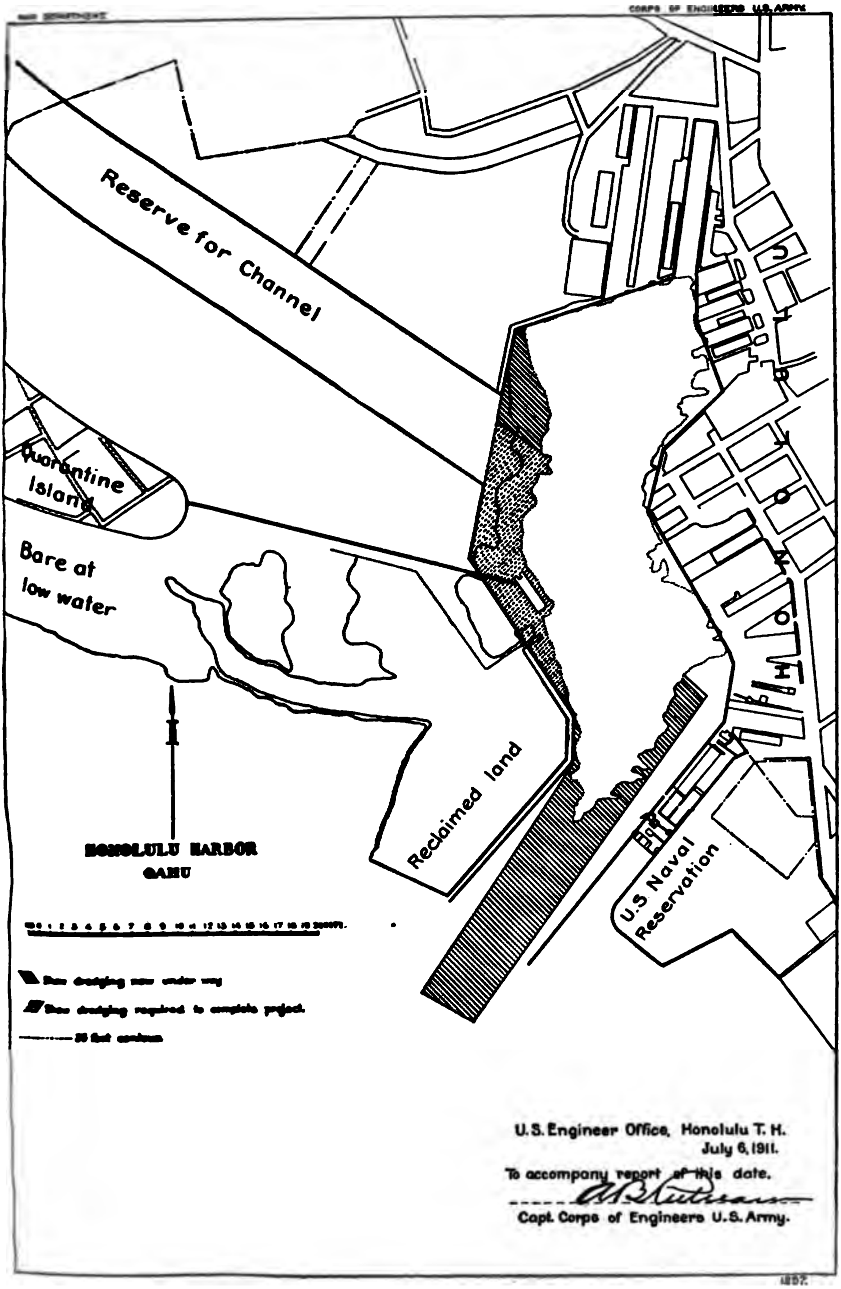
[From data furnished principally by the collector of customs of the port of Honolulu.]

Number and tonnage of vessels entering and clearing during the year.

Class.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	326	211	537	2,343,863
Sailing	169	17	186	197,684
Total	495	228	723	2,541.547

Inward freight traffic from United States to Hawaiian Islands.

Articles.	Quantity.	Valuation.
Animals	1,074 head	$184,494
Art works, etc		102,540
Breadstuffs	41,945 short tons	845,563
Wheat flour	101,987 barrels	167,628
Sundries		544,412
Cars, parts, etc.:		
Automobiles	401	831,077
Parts, and other cars		228.741
Cement	20,402 short tons	222,001
Coal	61,655 short tons	184,214
Clocks, etc		110,223
Cotton manufactures	10,742,762 yards	721,154
Clothing, etc		1,953,911
Drugs, etc		466,536
Earthenware		81,173
Explosives	500 short tons	190,245
Fertilizers	26,437 short tons	1,132,829
Fiber bags, twine, etc		96,350
Fish		396,077
Fruits		273,372
Furniture, glass, etc		322,896
Hay and animal foods	9,589 short tons	390,180
India rubber and manufactures		230,977
Ink		4,704
Instruments, scientific		218,185
Iron and iron manufactures		3,808,148
Jewelry		69,466
Lamps and leaden manufactures		72,009
Leather and manufactures		548,898
Marble and stone		13,344
Meats and meat products	1,301 short tons	459,036
Dairy products	1,448 short tons	424,797

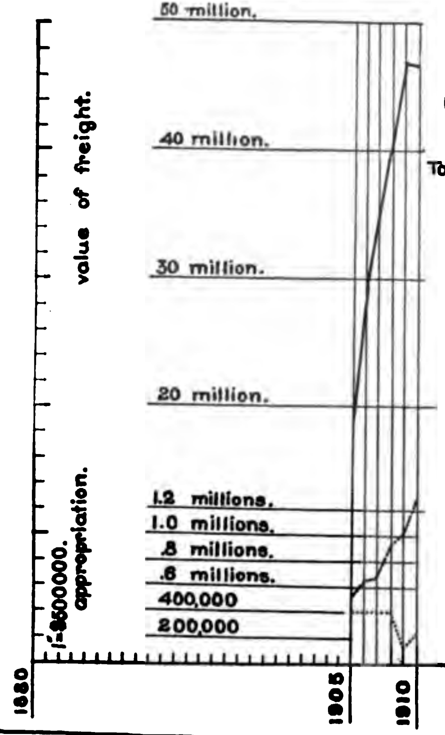


HONOLULU HARBOR
OAHU

Shows dredging now under way
Shows dredging required to complete project.
30 foot contour

U.S. Engineer Office, Honolulu T. H.
July 6, 1911.
To accompany report of this date.
Capt. Corps of Engineers U.S. Army.

1857.



Values in dollars. ——

U. S. Engineer Office Honolulu T. H.
July 6, 1911.

To accompany report of this date.

Capt. Corps of Engineers U. S. Army.

CHART.

Showing
freight amounts, values and
appropriations for

HONOLULU HARBOR T.H.

Freight in tons. —·—·—

Appropriation in dollars. ·········

Inward freight traffic from United States to Hawaiian Islands—Continued.

Articles.	Quantity.	Valuation.
Eggs	105,960 dozen	$39,422
Musical instruments		48,492
Naval stores		19,401
Oil	57,286,902 gallons	1,665,903
Paints		257,135
Paper and manufactures		521,969
Photographic goods		154,724
Spirits, wines, and malt liquors		661,969
Sugar, molasses, and confectionery		134,076
Tin manufactures		57,978
Toilet articles		290,381
Toys		26,037
Tobacco		629,326
Wearing apparel		340,040
Wood and manufactures:		
Logs		16,999
Lumber	67,446,000 feet b. m	1,044,245
Shingles	19,623 bundles	42,672
Other materials and manufactures		450,925
Miscellaneous		413,263
Total		22,095,087

The above figures represent the total valuation of inward freight traffic to the Hawaiian Islands, the totals for the principal ports being as follows:

Honolulu	$17,800,869
Kahului	1,268,520
Hilo	2,823,049
Mahukona	202,649
	22,095,087

Freight traffic.

IMPORTS FROM FOREIGN COUNTRIES.

Articles.	Quantity.	Value.
Food supplies		$1,568,679.00
Coal	67,398 tons	183,440.00
Spirits		346,474.00
Fertilizer	10,964 tons	203,612.00
Cement	2,224 tons	13,750.00
Chemicals		1,355,659.00
Iron and steel		110,758.00
Cottons		142,125.00
Bags	4,830 tons	486,321.00
Miscellaneous		811,984.00
Total		5,121,802.00

OUTWARD FROM HONOLULU.

Sugar	242,504 tons	$19,361,055.00
Fruits		2,312,532.00
Coffee	1,422 tons	342,868.00
Hides and skins	614 tons	121,698.00
Rice	3,629 tons	324,922.00
Miscellaneous		1,480,386.00
Total		23,943,461.00

Résumé for port of Honolulu.

Freight inward from United States	$17,800,869.00
Freight inward from foreign countries	5,221,802.00
Freight outward to United States and foreign countries	23,943,461.00
Total	[1] 46,866,132.00

---

[1] Excepting interisland traffic.

Passengers arrived and departed:	
Inward	12,518
Outward	13,302
Total	[1] 25,820
Interisland traffic to and from Honolulu for 12 months ending Dec. 31, 1910:	
Outward freight ... tons	186,435
Inward freight ... do	44,511
Inward (sugar) ... do	117,821
Total	348,767
Interisland passenger traffic to and from Honolulu for 12 months ending Dec. 31, 1910:	
Outward	31,748
Inward	31,740
Total	63,488
Customs duties collected	$1,717,581.28

W W 2.

IMPROVEMENT OF HILO HARBOR, HAWAII.

For history and description of this work see current summary, page 1058.

Under the contract entered into with Delbert E. Metzger on May 23, 1908, for breakwater construction, 47,075 tons of rock were placed during the fiscal year, making a total of 148,200 tons placed under this contract, which was completed on December 24, 1910.

On October 31, 1910, a contract was entered into with the Lord-Young Engineering Co. for a breakwater substructure. During the fiscal year 9,294 tons of rock were placed under this contract, completing 315 feet of substructure in advance of the 2,528 feet of the breakwater completed under the Metzger contract.

Harbor lines were established at Hilo Harbor, and were approved by the Secretary of War April 4, 1911.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for work of improvement	[2] $250,000

APPROPRIATIONS.

Mar. 2, 1907	$200,000.00
May 27, 1908	100,000.00
Mar. 4, 1909	100,000.00
June 25, 1910	200,000.00
Feb. 27, 1911	250,000.00
	850,000.00
Receipts from sales	1.50
	850,001.50

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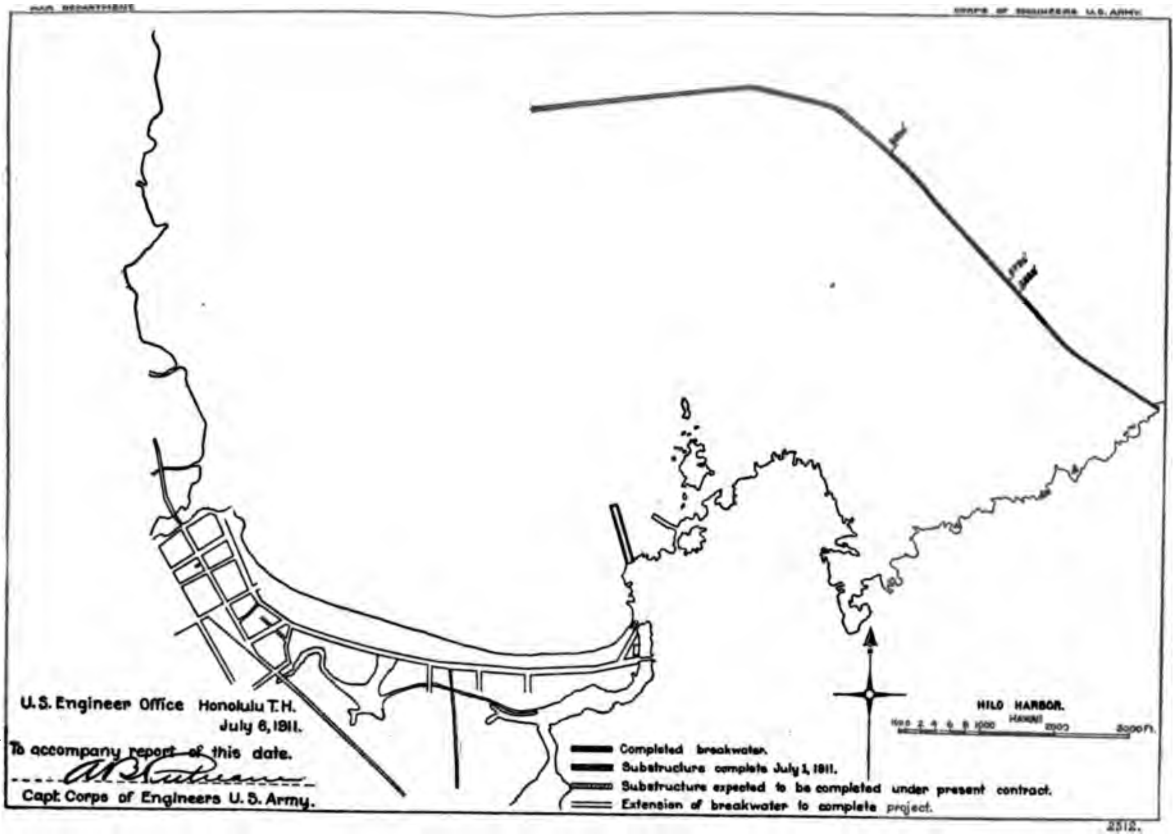
[1] Excepting interisland traffic.

[2] Exclusive of the balance unexpended July 1, 1911.


WAR DEPARTMENT
CORPS OF ENGINEERS U.S. ARMY.
HILO HARBOR.
HAWAII
100 0 2 4 6 8 1000 2000 3000 Ft.
Completed breakwater.
Substructure complete July 1, 1911.
Substructure expected to be completed under present contract.
Extension of breakwater to complete project.
2512.

U.S. Engineer Office Honolulu T.H.
July 6, 1911.

To accompany report of this date.

A. B. Putnam

Capt. Corps of Engineers U.S. Army.

CONTRACTS IN FORCE.

Contractor: Delbert E. Metzger.
Character of work: Breakwater construction.
Amount of work: 148,200 tons.
Rate: $2.485 per ton of 2,000 pounds for stone in place in the breakwater.
Date of approval: June 29, 1908.
Date of beginning work: September 12, 1908.
Date of completion: December 24, 1910.

Contractor: Lord-Young Engineering Co. (Ltd.).
Character of work: Breakwater construction.
Amount of work: 100,000 cubic yards.
Rate: $1.84 per ton of 2,000 pounds for stone in place in the substructure of the breakwater.
Date of approval: November 18, 1910.
Date of beginning work: February 20, 1911.
Date for completion of work: November 21, 1911.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1910.

Number and tonnage of vessels entering and clearing during the year.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	21	....	21	35,571
Sailing	51	....	51	33,687
Total	[1] 72	....	72	69,253

[1] Exclusive of interisland traffic.

Freight traffic.

OUTWARD.

Articles.	Quantity.	Valuation.
Sugar	79,509 tons	$7,554,616.00
Fruits		14,553.00
Coffee	112 tons	29,120.00
Hides and skins	55 tons	11,413.00
Miscellaneous		223,807.00
Total		7,833,509.00
Total inward freight (classification impracticable for lack of detailed data).		2,823,049.00
Total valuation of commerce		[1] 10,656,558.00

[1] Exclusive of interisland traffic.

Interisland traffic:	Tons
Outward freight	27,465
Inward freight	270
Inward freight (sugar)	45,416
Total interisland traffic	73,151

W W 3.

IMPROVEMENT OF KAHULUI HARBOR, HAWAII.

The first project adopted for the improvement of this harbor is that contained in the river and harbor act of June 25, 1910.

A contract was entered into December 8, 1910, with the Kahului Railroad Co., for rubble mound breakwater construction, strengthening and extending the existing breakwater. Work under this contract commenced April 22, 1911, and 5,549 tons of rock were placed in strengthening 360 linear feet of the old breakwater.

Estimate of additional funds required.

Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1]$75,000

APPROPRIATIONS.

June 25, 1910	$150,000
Feb. 27, 1911	150,000
	300,000

CONTRACTS IN FORCE.

Contractor: Kahului Railroad Co.
Character of work: Breakwater construction.
Amount: 73,000 tons.
Rate: $1.85 per ton of 2,000 pounds for stone in place in the breakwater.
Date of approval: December 28, 1910.
Date of beginning work: March 20, 1911.
Date for completion: March 28, 1912.

COMMERCIAL STATISTICS FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1910.

Number and tonnage of vessels clearing during the year.

Classes.	American.	Foreign.	Total.	Net registered tonnage.
Registered:				
Steamers	12	0	12	36,356
Sailing	18	2	20	19,624
Total	30	2	32	55,980

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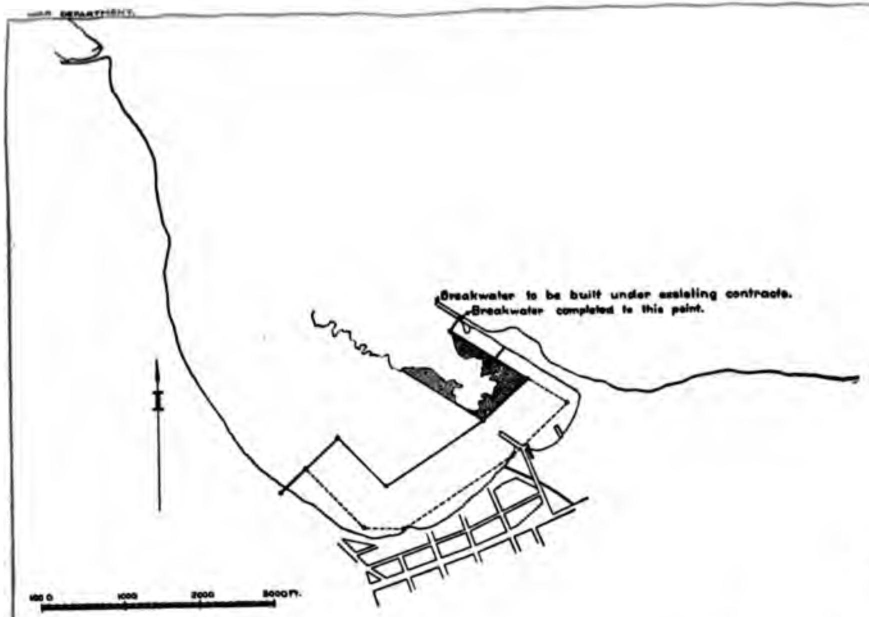
[1] Exclusive of the balance unexpended July 1, 1911.

WAR DEPARTMENT.

CORPS OF ENGINEERS, U.S. ARMY.


Breakwater to be built under existing contracts.
Breakwater completed to this point.
1000 0
1000
2000
3000 FT.

KAHULUI HARBOR
MAUI.

A.▇ Area to be dredged with appropriations now available.
B.▨ C.▨ Areas which are to be dredged, to complete project.

U.S. Engineer Office Honolulu T. H.
July 6, 1911.

To accompany report of this date.

Capt. Corps of Engineers U.S. Army.

3240.

Freight traffic.

OUTWARD.

Articles.	Quantity, designation.	Valuation.
Sugar	139,762 tons	$10,672,608
Fruits		167,348
Hides and skins	23 tons	4,339
Rice	2 tons	150
Miscellaneous		63,317
Total		[1] 10,907,757

[1] Exclusive of inter-island traffic.

INWARD.

From United States and foreign countries (classification impossible on account of lack of detailed information)		$1,268,520
From foreign countries:		
Coal	9,051 tons	28,522
Chemicals		45,326
		73,848

Inter-island traffic:	Tons.
Outward	2,848
Inward	23,070
Total	25,918

APPENDIX X X.

RIVER AND HARBOR IMPROVEMENTS IN THE DISTRICT OF PORTO RICO.

REPORT OF COL. S. W. ROESSLER, CORPS OF ENGINEERS, OFFICER IN CHARGE FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

IMPROVEMENTS.

1. San Juan Harbor, P. R.
2. Removing sunken vessels or craft obstructing or endangering navigation (indefinite).

United States Engineer Office,
New York City, July 20, 1911.

Sir: I have the honor to forward herewith annual reports upon works of river and harbor improvements under my charge in the Porto Rico district for the fiscal year ending June 30, 1911.

Very respectfully,

S. W. Roessler,
Colonel, Corps of Engineers.

The Chief of Engineers, United States Army.

X X 1.

IMPROVEMENT OF HARBOR AT SAN JUAN, P. R.

Work was carried on under a continuing contract with the Standard Dredging Co., of Wilmington, Del., for removing soft material at a cost of 19 cents per cubic yard (scow measurement) and coral rock at $6.80 per cubic yard (place measurement). With few delays, due to breakdown and bad weather, the work was continuous. On February 6, 1909, the winter weather having been unusually bad that year, a supplemental contract was made with the company whereby they were allowed, when the weather was too bad to tow to sea, to dump the material in a remote portion of the harbor, material so dumped to be paid for at the rate of 14 cents per cubic yard for soft material and $6.50 per cubic yard for coral rock—a reduction of 5 cents and 30 cents per cubic yard, respectively. This dumping ground was at such a point that it is improbable that it will ever have to be removed.

During the fiscal year there was removed 104,024 cubic yards of soft material and 23,185.43 cubic yards of rock.

The contract work of dredging was completed February 3, 1911, for work provided for by the approved project, except that the cut across St. Elena Shoal in the entrance channel was not as wide as was contemplated by 100 feet, but the width provided gives plenty of room for vessels, as there is ample depth on the opposite side of the channel.

The total material removed under contract was 1,850,751 cubic yards of soft material, at a cost of $341,097.89, and 52,467.97 cubic yards of rock, at a cost of $355,899.88.

The appropriation of $20,000 for maintenance made by the river and harbor act of June 25, 1910, has been expended in removing mud lumps in the inner harbor, which had developed since the dredging was completed by the contractors.

COMMERCIAL STATISTICS.

There is difficulty in obtaining exact commercial statistics for this harbor. The customhouse records are kept in money value only (not in tons), and apply to the whole of Porto Rico. As the class of material imported and exported is the same each year, and as the principal portion of the commerce of the island is done through San Juan, and the relative proportions done at other points remain about the same, a comparison of the money value of the whole commerce of Porto Rico will indicate any great change in the tonnage of San Juan Harbor.

Value of merchandise—	
Shipped to United States	$15,349,853
Shipped to foreign countries	679,645
Imported from the United States	(1)
Imported from foreign countries	2,221,482

Vessels entering and clearing at San Juan during the fiscal year ending June 30, 1911.

	Number.	Tonnage.
American vessels entered	269	414,383
Foreign vessels entered	191	311,927
American vessels cleared	229	374,313
Foreign vessels cleared	158	262,768

The exports consist principally of sugar, tobacco, coffee, and fruit, and the imports consist of provisions, cloth goods, iron and steel, lumber, and general merchandise.

APPROPRIATIONS.

Mar. 2, 1907	$157,500
May 27, 1908	220,000
Mar. 4, 1909	300,000
June 25, 1910	[2] 100,000
Total	777,500

X X 2.

REMOVING SUNKEN VESSELS OR CRAFT OBSTRUCTING OR ENDANGERING NAVIGATION (INDEFINITE).

Removal of the wreck of the schooner *Frank T. Stinson*, in Mayaguez Harbor, P. R. On January 12, 1911, an allotment of $3,000 was made for the removal of this wreck, and after proposals were invited by circular letter, the proposal of Alonso Aguilar to remove the wreck for $2,650 was accepted and contract made with him calling for removing the wreck in 30 days. Unfavorable weather conditions and lack of explosives delayed the work which, with two extensions, was finally completed on June 6, 1911. The total cost of removing the wreck was $2,757.14.

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[1] Statistics not available.

[2] $20,000 of this amount was for maintenance.

APPENDIX Y Y.

ANNUAL REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

. WAR DEPARTMENT,
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, D. C., July 18, 1911.

SIR: The Board of Engineers for Rivers and Harbors has the honor to submit the following report of its operations during the fiscal year ending June 30, 1911. Information concerning the organization of the board and its duties, as prescribed by the act of June 13, 1902, was contained in the board's annual report for the fiscal year ending June 30, 1904 (p. 3671). Subsequent acts of Congress have extended the scope of the board's investigations, and additional duties have been assigned to it by the Chief of Engineers from time to time.

In its last annual report the membership of the board on June 30, 1910, was recorded as follows: Col. William T. Rossell, Lieut. Col. William C. Langfitt, Lieut. Col. Henry C. Newcomer, Maj. Herbert Deakyne, and Maj. William J. Barden.

Since June 30, 1910, the following changes have occurred in the personnel of the board:

October 24, 1910, to November 29, 1910, by Special Orders, Nos. 50 and 55, Office of the Chief of Engineers, Lieut. Col. W. C. Langfitt, Corps of Engineers, was temporarily replaced as a member of the board, by Col. Dan C. Kingman.

January 20, 1911, to May 23, 1911, by Special Orders, Nos. 2 and 14, Office of Chief of Engineers, Maj. Herbert Deakyne was temporarily replaced as a member of the board by Lieut. Col. Harry Taylor, Corps of Engineers.

May 22, 1911, by Special Orders, No. 14, Col. Solomon W. Roessler was detailed as a member of the board, vice Lieut. Col. Henry C. Newcomer, temporarily relieved, to take effect June 10, 1911.

On June 30, 1911, the membership of the board was as follows: Col. William T. Rossell, Col. Solomon W. Roessler, Lieut. Col. William C. Langfitt, Maj. Herbert Deakyne, and Maj. William J. Barden, Corps of Engineers.

At the close of the preceding fiscal year the board had received all but six reports ordered by the act of March 3, 1909. On June 30 1911, five were still outstanding, four of them being surveys of considerable magnitude. Several reports of surveys which were ordered following reports on preliminary examinations of that act are under consideration and some have not yet been received, so that on June 30, 1911, 29 cases of the act of March 3, 1909, remained for final disposition.

The act of June 25, 1910, ordered three investigations in section 1, and 184 examinations in section 3. By June 30, 1911, 169 reports had been received, and final action had been taken on 105.

The act of February 27, 1911, ordered two investigations in section 1 and 88 examinations in section 2. Up to the close of the fiscal year the board had received 27 reports and had taken final action on two of them.

In compliance with resolutions of the Committee on Commerce and the Committee on Rivers and Harbors, and under instructions from the Chief of Engineers, United States Army, the board considered and reported its conclusions on the following subjects during the last fiscal year:

Palacios to Matagorda Bay, Tex.
Aransas Pass to Rockport, Tex.
Rehoboth Bay to Delaware Bay, Del.
Cumberland River, Dam No. 20.
Nansemond River, Va.
Absecon Inlet, N. J.
Texas City Dike, Tex.
Shipyard Creek, S. C.

There are now under consideration by the board seven resolutions of the committees mentioned.

By direction of the Chief of Engineers the board has in progress the preparation of a compilation of drawings and data showing typical forms of construction used in works of river and harbor improvement. As the various sheets are completed they are issued in mimeograph form, accompanied by related text. Memorandum No. 1, with four sheets, has been issued and 14 other sheets have been prepared for issue in this manner. This work has considerably increased the business of the office. It is in immediate charge of Col. D. W. Lockwood, United States Army, retired, assistant to the board.

In connection with the various subjects referred to it for report and recommendations, the board held public hearings and made inspections as follows:

Place of hearing.	Date.	Subject.
Ashtabula, Ohio	July 26, 1910	Ashtabula Harbor.
Manistee, Mich	July 27, 1910	Manistee Harbor.
Chattanooga, Tenn	Sept. 13, 1910	Tennessee River (inspection, Knoxville to Iuka).
New Orleans, La	Oct. 19, 1910	Intercoastal waterway (inspection, Pensacola to Franklin).
Mobile, Ala	Oct. 20, 1910	Do.
Pensacola, Fla	Oct. 21, 1910	Do.
Charleston, S. C	Mar. 14, 1911	Shipyard Creek.
Bradentown, Fla	Mar. 15, 1911	Manatee River.
Boca Grande, Fla. (inspection only)	Mar. 16, 1911	Charlotte Harbor.
New York, N. Y	Mar. 29, 1911	Harlem River.
Prince Bay, N. Y	do	Lemon Creek.
Troy, N. Y	Apr. 8, 1911	Hudson River.
Charleston, S. C	June 13, 1911	Charleston Harbor.

Fifty-six hearings to Members of Congress and other interested persons were given at the office of the board in relation to the following subjects:

Subject.	Date.
Tennessee River at Muscle Shoals	Oct. 3, 1910
Deckers Creek, W. Va	Oct. 17, 1910
Tennessee River at Muscle Shoals	Oct. 31, 1910
Savannah River, Ga	Do.
Mystic River, Mass	Dec. 5, 1910
Mississippi River, opposite St. Louis	Dec. 12, 1910
St. Croix River at Afton, Minn	Do.
Niagara River, N. Y	Do.
Frankford Creek, Pa	Do.
Weymouth Fore River, Mass	Do.
Sabine-Neches Ship Canal	Dec. 13, 1910
Cove Harbor, Conn	Do.
Tilghman Island Harbor, Md	Do.
Winchester Harbor, Md	Do.
Twitch Cove and Big Thoroughfare River, Md	Do.
Pascagoula River, Miss	Dec. 19, 1910
Hudson River at Troy	Do.
Zipple Bay, Minn	Do.
Medomac River, Me	Do.
Sulphur River, Tex	Jan. 3, 1911
Channel connecting Red and Sulphur Rivers	Do.
Waterways from Orangeburg to Charleston, S. C	Do.
Chelsea Creek, Boston Harbor, Mass	Jan. 4, 1911
Harlem River, N. Y	Jan. 9, 1911
Long Beach Harbor, Cal	Do.
Tennessee River	Jan. 10, 1911
Manistee Harbor, Mich	Do.
Arcadia Harbor, Mich	Do.
Long Beach Harbor, Cal	Jan. 16, 1911
Cape Lookout Harbor, N. C	Do.
Minnesota River	Do.
Manistee Harbor, Mich	Jan. 23, 1911
Maumee River, Ohio	Do.
Harbors on the island of Kauai, Hawaii	Jan. 24, 1911
Red River of the North	Jan. 30, 1911
St. Marys River, Mich	Feb. 6, 1911
Tillamook Bay and Bar, Oreg	Do.
Chincoteague Inlet, Va	Do.
Tennessee River at Muscle Shoals	Feb. 7, 1911
Long Beach, Bridgeport Harbor, Conn	Feb. 13, 1911
Two Rivers Harbor, Wis	Do.
Cowhead Creek, Ga	Feb. 20, 1911
Broad Creek, Md	Feb. 27, 1911
Chester River, Pa	Mar. 6, 1911
Yellowstone River	Mar. 13, 1911
Charlotte Harbor, Fla	Do.
Mulberry and Locust Forks, Warrior River	Apr. 3, 1911
Absecon Creek, N. J	Do.
Plymouth Harbor, Mass	Apr. 17, 1911
Sammamish River, Wash	Do.
Yalobusha River, Miss	May 1, 1911
Hoquiam River, Wash	May 15, 1911
Mulberry and Locust Forks, Warrior River	Do.
Tennessee River	May 22, 1911
Elizabeth River, N. J	June 19, 1911
St. Francis and L'Anguille Rivers	June 26, 1911

Expenses of the board during the fiscal year may be briefly summarized as follows:

Rent of offices	$1,800.00
Salaries of civilian assistants	9,750.83
Mileage and traveling expenses	7,974.88
Miscellaneous	2,860.10
Total	22,385.81

For the board:

Very respectfully,

Wm. T. Rossell,
Colonel, Corps of Engineers,
Senior Member of the Board.

The Chief of Engineers, United States Army.

APPENDIX Z Z.

STATEMENT OF FLOATING PLANT OWNED BY THE UNITED STATES AND EMPLOYED IN THE ENGINEER DEPARTMENT AT LARGE FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

Reports of operations of dredging plants owned and operated by the Engineer Department at Large, United States Army.

[Compiled for the fiscal year ending June 30, 1911, and shown in tabular form.]

Table I.—Seagoing hopper dredges.
Table II.—Pipe-line hydraulic dredges.
Table III.—Dipper and bucket dredges.
Table IV.—Snag boats.
Table V.—Alphabetical list of vessels by classes.
Table VI.—Complete list of floating plant by districts.

TABLE I.—*Performances of United States seagoing dredges for the fiscal year ending June 30, 1911.*

Name	*Atlantic.* (Ambrose Channel.)	*Atlantic.* (S.W. Pass Miss. River.)	*Benyaurd.*	*Burton.*
Where built	Sparrows Point, Md		Richmond and Norfolk, Va	Sparrows Point, Md.
When built	1904–5		1900–1904	1905.
Builder	Maryland Steel Co		Wm. R. Trigg Co., of Richmond, Va. Norfolk Navy Yard	Maryland Steel Co.
Contract cost	$304,000[1]		$286,605	$165,000.
Cost of outfit	$37,577.24		$127,633.37[1]	$19,300.
Time to build	20 months		3 years	1 year 4 months.
Material of hull	Steel		Steel	Steel.
Length over all	288 feet		271 feet 6 inches	177 feet.
Length between perpendiculars	274 feet		260 feet	166 feet.
Beam	47 feet 6 inches		47 feet 6 inches	38 feet.
Depth amidship	25 feet		23 feet	19 feet.
Drafts, light:				
Forward	10 feet 6 inches		11 feet 2 inches	8 feet 10 inches.
Aft	12 feet 6 inches		12 feet 6 inches	11 feet.
Drafts, loaded:				
Forward	21 feet		19 feet	17 feet 6 inches.
Aft	21 feet 6 inches		20 feet 6 inches	17 feet 3 inches.
Displacement:				
Light	2,670 tons		2,978 tons	1,510 tons.
Loaded	5,670 tons		5,436 tons	2,795 tons.
Number of hoppers	2		2	2.
Total capacity of hoppers	2,476 cubic yards		2,214 cubic yards	935 cubic yards.
Number of drags	2		2	2.
Number, size, and type:				
Dredging pumps	Two—20-inch centrifugal		Two—20-inch centrifugal	Two—15-inch centrifugal pumps.
Pumping engines	Two—16 and 32 by 18 inch compound.		Two—16 and 32 by 20 inch compound.	Two—12 and 22 by 14 inch compound.
Revolutions per minute of pumping engines.	160		150	230 to 250.
Total indicated horsepower of pumping engines.	616, on test Oct. 11, 1910; steam pressure 112 lbs.		738	334.5 while pumping.
Number, type, and size of propelling engines.	Two—22 and 44 by 30 inch; compound.		2—compound; 20 and 40 by 30 inches.	2—vertical compound; cylinders, 15 and 30 inches; stroke, 24 inches.
Revolutions per minute of propelling engines:				
Light	108		140	106.
Loaded	104		130	96.
While dredging	0 to 60		Variable	
Total indicated horsepower of propelling engines.	1,412; steam pressure, 113 pounds		1,500	745.9.

Average speed:				
Light	9.8 knots		9.5 knots	7 knots.
Loaded	8 knots		7.5 knots	5½ knots.
While dredging	0 to 2.5 knots		5 to 1 knots	1½ knots.
Number and type of boilers	4 Scotch marine		4 Scotch marine	2 single-ended Scotch.
Dimensions of boilers:				
Diameter	14 feet		13 feet 6 inches	13 feet.
Length	12 feet		12 feet	12 feet.
Heating surface (total)	10,704 square feet		10,528 square feet	4,124 square feet.
Grate surface (total)	280 square feet		290 square feet	125 square feet.
Boiler pressure (gauge)	113		120 pounds	120 (average).
Number of men in crew	57		63	28.
Operations.				
Location of dredging	Ambrose Channel (to Nov. 10, 1910).	Southwest Pass, Mississippi River.	Southwest Pass, Mississippi River.	Toledo, Sandusky, Lorain, Ashtabula, Cleveland, Fairport, Conneaut, and Cleveland, Ohio, district.
Average depth before dredging	30 to 36 feet	25 feet	21 feet	20 feet.
Average depth after dredging	35 to 42 feet		30 feet	22 feet.
Character of dredged material	90 per cent sand, 10 per cent mud and stone.	Sand, silt, and mud	Sand, mud, and silt	Sand, mud, and clay.
Average distance from work to dump	0.5 statute mile	2 miles	2.5 miles	3.9.
Material dredged during year	657,129 cubic yards (July 1–Nov. 10).	Sand, mud, and water, 2,680,909 cubic yards; sand and mud, 1,043,141.5 cubic yards.	1,983,494 cubic yards	201,662 cubic yards.
Total number of loads	309	1,099	1,934	286.
Average number of loads dredged per day	3.47	6	7.52	1.47 (194 working days).
Total amount per load	2,127 cubic yards	Sand, mud, and water, 2,440 cubic yards; sand and mud, 949.1 cubic yards.	1,025.59	705 cubic yards.
Average amount dredged:				
Per day	7,383 cubic yards (89 days)	5,702.2 cubic yards sand and mud.	7,717.9 cubic yards	1,039 cubic yards (194 working days).
Per hour	645.9 cubic yards	237.5 cubic yards sand and mud.	619.97 cubic yards	104 cubic yards (9.96 hours per day).
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.				
Time at work:				
Pumping	1,017 hours 25 minutes	2,388 hours 5 minutes	3,199.3 hours	854 hours 18 minutes.
To and from dump	661 hours 40 minutes	429 hours 30 minutes	775.9 hours	343 hours 21 minutes.
Dumping	51 hours 30 minutes	196 hours 5 minutes	675 hours	8 hours 38 minutes.
Taking fuel and supplies	180 hours	336 hours 35 minutes	662.6 hours	43 hours 15 minutes.
To and from wharf or anchorage	36 hours 50 minutes	131 hours 15 minutes	134.4 hours	144 hours 87 minutes.
Turning in cut	51 hours 25 minutes			
Total time at work	1,998 hours 50 minutes	3,481 hours 30 minutes	5,447.2 hours	1,394 hours 29 minutes.
Total working time (less Sundays and holidays).	2,688 hours	4,392 (Nov. 25, 1910, to June 30, 1911).	7,344 hours	

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Atlantic.*		*Atlantic.*		*Benyaurd.*		*Burton.*	
DISTRIBUTION OF TIME AND VALUE OF LOST TIME—continued.								
Time lost from work:								
Bad weather	1 hour 45 minutes		341 hours 5 minutes		245.4 hours		108 hours 29 minutes.	
Ordinary repairs	392 hours 5 minutes		119 hours 10 minutes		1,072.1 hours		65 hours 2 minutes.	
Extraordinary repairs					180.4 hours		896 hours.	
Alterations and additions	216 hours						66 hours.	
Miscellaneous	79 hours 20 minutes		450 hours 15 minutes		398.9 hours			
Total lost time	689 hours 10 minutes		910 hours 30 minutes		1,896.8 hours			
Operating cost per year					$94,185.81			
Average cost per working hour					$12.82			
Value of time lost					$24,316.97			
Number of days on which any dredging was done	89		183		257		143.	
Average time to dredge 1 load	3 hours 18 minutes		2 hours 9.2 minutes		1.66 hours		2.987 hours.	
Average time to dump 1 load	10 minutes		10.6 minutes		0.35 hour		1¼ minutes.	
Average time spent going to and from dump per load	2 hours 8 minutes		23.3 minutes		0.40 hour		1.2 hours.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.								
Pay roll	$15,254.33	27.40	$21,402.06	34.70	$34,839.83	27.00	$15,001.16	55.10
Coal	9,668.35	17.30	24,224.71	38.90	37,178.87	28.82	5,302.94	19.54
Water	167.70	.27						
Supplies:								
Subsistence	5,088.94	9.20	5,698.16	9.16	10,558.49	8.18	3,522.00	12.93
Engine room	778.80	1.40	1,659.39	2.60	2,295.08	1.78	490.04	1.82
Miscellaneous	2,281.80	4.10	2,490.35	4.00	1,843.17	1.43	391.04	1.43
Renewals of or addition to outfit	4,677.62	8.35	4,480.53	7.20	7,049.49	5.46	1,047.35	3.84
Ordinary repairs	11,091.32	19.90	368.56	.54	10,419.37	8.08	1,179.98	4.33
Extraordinary repairs					22,341.46	17.32		
Alterations and additions to vessel					194.92	.15		
Laundry and miscellaneous expenses, wharfage, etc.	857.42	1.53	852.80	1.30	420.88	.33	279.50	1.01
Office expenses	2,666.81	4.76	1,013.19	1.60	1,877.78	1.45		
Surveys	3,303.69	5.95						
Total cost	$55,836.78	100.00	$62,189.75	100.00	$129,019.34	100.00	$27,214.07	100.00

Cost per cubic yard with no repairs or additions.	$0.0519	$0.0509	$0.047	$0.128.
Cost per cubic yard with ordinary repairs.	$0.0776	$0.0590	$0.0650	$0.129.
Total cost per cubic yard	$0.0834	$0.0596	$0.065	$0.134.
MISCELLANEOUS.				
Fuel consumed during year	3,167 tons	57,959 barrels	90,411 barrels	1,971.6 tons.
Average cost of fuel	$3.05¼ per ton	$0.418 per barrel	$0.374 per barrel	$2.08 per ton.
Fuel consumed per yard of dredged material.		10 pounds	15.7 pounds	19.3 pounds.
Water, cost per 1,000 gallons	$0.25			
Water purchased during year	719,680 gallons			
Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	*Remarks.*
Operating costs are exclusive of ordinary and extraordinary repairs, additions and alterations, office expenses, and surveys.	Total cost, due to changes while building, $361,500. The Atlantic was leased to Southwest Pass, and left New York Nov. 10, 1910. She had previously spent 14 days repairing and putting in order, and 9 days installing evaporator and preparing for trip.		Includes finishing at the Norfolk navy yard due to failure of the Wm. R. Trigg Co., of Richmond, Va., the contractors.	Dredge laid up at winter quarters from Dec. 3 to Apr. 16, inclusive. Total cost per cubic yard, deducting winter expenses, 9.7 cents.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name.	*Cape Fear.* (Cape Fear River.)	*Cape Fear.* (Beaufort Inlet.)	*Caucus.*	*Charleston.* (Charleston Harbor.)
Where built	Philadelphia, Pa.		Greensport, Long Island	Brooklyn, N. Y.
When built	1895.		1905.	1891.
Builder	Chas. Hilman Ship & Engine Building Co.		James Reilly Repair & Supply Co.	Henry Lawrence.
Contract cost	$55,780.		$150,000.	$65,000.
Cost of outfit	$60,809.30.		$26,000.	$4,000 (approximate).
Time to build	9 months.		2 years 7 months.	9 months.
Material of hull	Wood.		Wood.	Oak frame, oak and pine planking.
Length over all	131 feet 3 inches.		200 feet.	122 feet 6 inches.
Length between perpendicles	113 feet 9 inches.		185 feet.	117 feet.
Beam	29 feet.		41 feet.	30 feet.
Depth amidship	12 feet.		23 feet 2 inches.	12 feet.
Drafts, light:				
Forward	7 feet 4 inches.		13 feet 6 inches.	10 feet 8 inches.
Aft	13 feet 4 inches.		14 feet 6 inches.	12 feet 1 inch.
Drafts, loaded:				
Forward	15 feet 3 inches.		19 feet 6 inches.	15 feet 5 inches.
Aft	12 feet 11 inches.		18 feet 6 inches.	17 feet 1 inch.
Displacement:				
Light	480 tons.		1,400 tons.	800 tons.
Loaded	870 tons.		2,680 tons.	1,100 tons.
Number of hoppers	2.		2.	2.
Total capacity of hoppers	300 cubic yards.		977 cubic yards.	318 cubic yards.
Number of drags	2.		2.	1.
Number, size, and type:				
Dredging pumps	Two 10-inch centrifugal.		Two—18-inch centrifugal.	One—15-inch centrifugal, Edwards make.
Pumping engines	Two—10½-inch diameter by 10½-inch stroke.		Two—14 and 26 by 18 inch compound.	One—fore-and-aft compound engine, 13 and 23 by 14 inch stroke.
Revolutions per minute of pumping engines.	245.		185.	225.
Total indicated horsepower of pumping engines.	175.		670.	250.
Number, type, and size of propelling engines.	One 15 inch and 30 by 24 inch compound.		One 22 and 44 by 30 inch compound.	One—steeple compound, 17 and 32 by 22 inch stroke.
Revolutions per minute of propelling engines:				
Light	135.		88.	120.
Loaded	126.		82.	110.
While dredging	72.		82.	75.
Total indicated horsepower of propelling engines.	390.		725.	360.

Average speed:				
Light	8 knots		9 knots per hour	8½ knots.
Loaded	5 knots		6 knots per hour	6½ knots.
While dredging	2 knots		1 knot per hour	3 knots.
Number and type of boilers	1 Scotch marine		2 Scotch marine	1 Scotch marine.
Dimensions of boilers:				
Diameter	12 feet 6 inches		14 feet	13 feet.
Length	11 feet ⅜ inch		12 feet	12 feet.
Heating surface (total)	1,800 square feet			1,775 square feet.
Grate surface (total)	61 square feet			72 square feet.
Boiler pressure (gauge)	120 pounds per square inch		120 pounds per square inch	105 pounds per square inch.
Number of men in crew	16 single crew, 32 double crew		34	25.
Operations.				
Location of dredge	Cape Fear River and Bar	Beaufort Inlet, N. C.	Pensacola Harbor and St. Andrews Bay, Fla.	Charleston Harbor, S. C.
Average depth before dredging	20 to 22 feet	14.7 feet	27 feet at Pensacola; 18½ feet at St. Andrews Bay.	16 to 28 feet.
Average depth after dredging	24 to 26 feet	20 feet	34 feet at Pensacola; 19 feet at St. Andrews Bay.	18 to 28 feet.
Character of dredged material	Sand, clay, shell, and mud	Coarse sand	Sand	Sand, shell, and mud.
Average distance from work to dump	About 2 miles	1 mile	2¾ miles at Pensacola; ¾ mile at St. Andrews Bay.	¾ mile.
Material dredged during year	373,500 cubic yards	237,003 cubic yards	1,001,209 cubic yards	347,027 cubic yards.
Total number of loads	1,248	859	1,069	1,282.
Average number of loads dredged per day	10.06	7.53	4.757	8.3.
Total amount per load	299.2 cubic yards	276 cubic yards	936.58 cubic yards	270.7 cubic yards.
Average amount dredged:				
Per day	3,012.1 cubic yards	2,079 cubic yards	4,469.68 cubic yards	2,238.9 cubic yards.
Per hour while pumping	257— cubic yards	327 cubic yards	1,007.16 cubic yards	317.5 cubic yards.
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.				
Time at work:				
Pumping	1,499 hours 7 minutes	725 hours 35 minutes	994 hours 5 minutes	1,092 hours 58 minutes.
To and from dump	558 hours 9 minutes	299 hours 20 minutes	715 hours 48 minutes	254 hours 53 minutes.
Dumping	140 hours 19 minutes	106 hours 4 minutes	77 hours 35 minutes	109 hours 38 minutes.
Taking fuel and supplies	168 hours 52 minutes	67 hours 12 minutes	188 hours 48 minutes	62 hours 40 minutes.
To and from wharf or anchorage	54 hours 46 minutes	128 hours 26 minutes	505 hours 26 minutes	307 hours 22 minutes.
Total time at work	2,487 hours 13 minutes	1,326 hours 37 minutes	2,481 hours 42 minutes	1,827 hours 31 minutes.
Total working time in year (less Sundays and holidays).			7,344 hours	
Time lost from work:				
Bad weather	359 hours 8 minutes	557 hours 12 minutes	201 hours 48 minutes	177 hours 7 minutes.
Ordinary repairs	393 hours 4 minutes	187 hours 25 minutes	323 hours 8 minutes	208 hours 41 minutes.
Extraordinary repairs		72 hours	102 hours 24 minutes	558 hours 45 minutes.
Alterations and additions				
Miscellaneous	36 hours 35 minutes		3,750 hours	68 hours 25 minutes.
Total lost time	788 hours 47 minutes		4,862 hours 18 minutes	1,012 hours 58 minutes.
Operating cost for year			$44,528.47	
Average cost per working hour			$6.063	

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Cape Fear.*		*Cape Fear.*		*Caucus.*		*Charleston.*	
DISTRIBUTION OF TIME AND VALUE OF LOST TIME—continued.								
Value of time lost					$29,480.13			
Number of days on which any dredging was done.	124		114		224		155.	
Average time to dredge 1 load	1 hour 12 minutes		51 minutes		55.59 minutes		51 minutes.	
Average time to dump 1 load	6.8 minutes		7½ minutes		4.35 minutes		5 minutes.	
Average time spent going to and from dump per load.	27 minutes		21 minutes		40.17 minutes		12 minutes.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.								
Pay roll	[1] $8,785.69	39.65	$6,312.59	42.20	$22,669.79	46.02	$10,713.37	27.51
Coal	4,850.54	21.95	2,550.11	17.00	11,452.72	23.25	3,570.78	9.16
Water	[2] 296.75	1.34	472.18	3.10	826.55	1.68	103.71	.26
Supplies:								
Subsistence	2,361.86	10.66	1,733.52	11.55	6,064.59	12.31	3,212.67	8.24
Engine room	597.67	2.69	427.03	2.86	1,592.89	3.23	660.64	1.70
Miscellaneous			237.29	1.58	1,075.68	2.18	1,287.50	3.30
Renewals of or additions to outfit	389.65	1.75	113.81	.76			70.25	.18
Ordinary repairs	2,426.11	10.93	731.91	4.88	2,328.27	4.73	1,186.17	3.04
Extraordinary repairs	405.00	1.82	601.50	4.00	2,128.78	4.32	15,217.73	39.10
Alterations and additions to vessel			896.38	6.00				
Laundry and miscellaneous expenses, wharfage, etc.			152.23	1.01	846.35	1.72	556.82	1.43
Office expenses	[3] 1,722.00	7.76	758.82	5.05	275.00	.56	1,700.10	4.37
Surveys	322.00	1.45					666.66	1.71
Total cost	$22,157.27	100.00	$14,987.37	100.00	$49,260.62	100.00	$38,946.40	100.00
Cost per cubic yard with no repairs or additions.	$0.051		$0.0538		$0.0447		$0.0579.	
Cost per cubic yard with ordinary repairs.	$0.058		$0.0569		$0.0471		$0.0610.	
Total cost per cubic yard	$0.059		$0.0632		$0.0492		$0.1122.	

MISCELLANEOUS.				
Fuel consumed during year	1,392.88 short tons	406.06 short tons	3,704.6 short tons	939.78 short tons.
Average cost of fuel	$3.461 per short ton	$4.14 per short ton	$3.09 per short ton	$3.56 per short ton.
Fuel consumed per yard of dredged material.	7.5 pounds	4.18 pounds	7.40 pounds	5.41 pounds.
Water, cost per 1,000 gallons		$0.471[1]	$1	$10 and $25, respectively.[1]
Water purchased during year (gallons)		1,000,000 gallons	826,547 gallons	290,450 gallons.
	Remarks. The seagoing dredge Cape Fear was in Beaufort district until December when she returned to Wilmington district taking Comstock in tow to Jacksonville, Fla., for repairs. Cape Fear on return from Jacksonville stopped at Savannah for repairs, returning to work on Ocean Bar Jan. 19, 1911. This report is for dredge while working on Cape Fear River and bar from Dec. 28, 1910, to June 30, 1911. Operating costs are exclusive of ordinary and extraordinary repairs, additions, and alterations, office expenses and surveys. [1] Operating during December included. [2] Including labor and plant for pumping. [3] Including superintendence.	*Remarks.* [1] Cost of running launch for water.		*Remarks.* [1] Drinking water.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Charleston* (Mobile, Ala.).	*Chinook.*[1]	*Clatsop.*	*Comstock, General C. B.*
Where built	See page 2666	Belfast, Ireland	Newport News, Va	Perth Amboy, N. J.
When built		First built, 1892; remodeled at San Francisco, Cal., 1903;[2] remodeled at Portland, Oreg., 1910.[3]	1908	1895.
Builder		Harland & Wolfe	Newport News Shipbuilding Co.	Bucyrus Steam Shovel Co.
Contract cost		4	$234,500	$86,000.
Cost of outfit		4		$10,000.
Time to build		4	1 year 4 months	10 months.
Material of hull		Steel	Steel	Wood.
Length over all		460 feet	180 feet	177 feet.
Length between perpendiculars		445 feet	168 feet	165 feet.
Beam		49 feet	38 feet	35 feet 6 inches; over all, 36 feet 6 inches.
Depth amidship		34 feet	23 feet	16 feet.
Drafts, light:				
Forward		15 feet 6 inches	10 feet	8 feet 6 inches.
Aft		16 feet 8 inches	17 feet 6 inches	14 feet.
Drafts, loaded:				
Forward		23 feet 7 inches	21 feet 6 inches	16 feet 6 inches.
Aft		do	do	15 feet 6 inches.
Displacement:				
Light		7,000 tons	1,360 tons	1,100 tons.
Loaded		11,000 tons	3,158 tons	1,900 tons.
Number of hoppers		2	2	2.
Total capacity of hoppers		3,600 cubic yards	1,061 cubic yards	640.3 cubic yards.
Number of drags		2	2	2.
Number, size, and type:				
Dredging pumps		Two—20-inch centrifugal	Two—18-inch centrifugal	Two—15-inch centrifugal.
Pumping engines		Two—13 and 20 and 31½ by 20 inch triple expansion.	Two—12 and 26 by 18 inch compound.	Two—12 and 22 by 14 inch compound.
Revolutions per minute of pumping engines.		170	152	195 to 210.
Total indicated horsepower of pumping engines.		1,000	500	340.
Number, type, and size of propelling engines.		Two—22½ and 36½ and 60 by 24 inch triple expansion.	One—20 and 44 by 30 inch compound.	One—20 and 36 by 26 inch compound.
Revolutions per minute of propelling engines:				
Light		170	104	135.
Loaded		165	100	125.
While dredging		75	86	100.
Total indicated horsepower of propelling engines.		3,800	900	514.

Average speed:				
Light	See page 2666	12 miles per hour	8.06 miles per hour	10 knots.
Loaded		11 miles per hour	6.75 miles per hour	8 knots.
While dredging		3 miles per hour	2 miles per hour	4 knots.
Number and type of boilers		4 Scotch; 2 double and 2 single end	2 Scotch marine, return, tubular	2 Scotch.
Dimensions of boilers:				
Diameter		14 feet 1 inch	13 feet	10 feet.
Length		Two 17 feet; two 9 feet 9 inches	12 feet	11 feet.
Heating surface (total)		13,473 square feet	3,942 square feet	1,292 square feet.
Grate surface (total)		400 square feet	130 square feet	30 square feet.
Boiler pressure (gauge)		175 pounds	135 pounds	130 pounds.
Number of men in crew		45	44	41.
Operations.				
Location of dredging	Mobile outer bar	Columbia River below Astoria and Columbia River bar.	Columbia River between Mount Coffin and Astoria.	Ocean bar and Snows Marsh Channel, Cape Fear River, N. C.
Average depth before dredging	21 feet	Columbia River, 21 feet; Columbia River bar, 24 feet 6 inches.	21½ feet	22 to 24 feet.
Average depth after dredging	30 feet	Columbia River, 25 feet; Columbia River bar, 26 feet 6 inches.	25½ feet	24 to 26 feet.
Character of dredged material	Fine sand	Fine gray sand	Sand	Sand, clay, mud, and shells.
Average distance from work to dump	½ mile	Columbia River, 3 miles; Columbia River bar, 1.25 miles.	2 miles	About 2 miles.
Material dredged during year	32,184 cubic yards	722,431 cubic yards	2,352,787 cubic yards	1,508,414 cubic yards.
Total number of loads	120	369	2,241	2,244.
Average number of loads dredged per day	8.6	2.3	10.3 (20 hours)	9.55.
Total amount per load	268.2 cubic yards	1,958 cubic yards	1,050 cubic yards	672 cubic yards.
Average amount dredged:				
Per day	2,298.9 cubic yards	4,509 cubic yards	10,840 of 20 hours	6,419 cubic yards.
Per hour	373.15 cubic yards	426 cubic yards	542	607 cubic yards.
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.				
Time at work:				
Pumping	86 hours 15 minutes	1,166 hours 35 minutes	2,526 hours 25 minutes	2,483 hours 40 minutes.
To and from dump	26 hours	147 hours 5 minutes	891 hours 45 minutes	663 hours 40 minutes.
Dumping	21 hours 15 minutes	86 hours 23 minutes	188 hours	145 hours 36 minutes.
Taking fuel and supplies	22 hours	100 hours 5 minutes	571 hours 20 minutes	284 hours 35 minutes.
To and from wharf or anchorage	40 hours 45 minutes	197 hours 18 minutes	166 hours 45 minutes	237 hours 50 minutes.
Total time at work	196 hours 15 minutes	1,697 hours 26 minutes	4,343 hours 15 minutes	3,815 hours 21 minutes.[1]
Total working time in year (less Sundays and holidays).		2,587 hours 16 minutes, in commission.	7,344 hours	7,344 hours.
Time lost from work:				
Bad weather		82 hours	62 hours 10 minutes	226 hours 49 minutes.
Ordinary repairs	8 hours	398 hours 45 minutes	382 hours 25 minutes	497 hours 16 minutes.
Extraordinary repairs	527 hours 15 minutes	389 hours 45 minutes	145 hours	1,174 hours.
Alterations and additions				
Miscellaneous	12 hours 30 minutes	19 hours 20 minutes	2,411 hours 10 minutes	1,530 hours 44 minutes.
Total lost time	547 hours 45 minutes	889 hours 50 minutes	3,000 hours 45 minutes	3,528 hours 49 minutes.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name.	*Charleston.* (Mobile, Ala.)		*Chinook.*		*Clatsop.*		*Comstock, General C. B.*	
DISTRIBUTION OF TIME AND VALUE OF LOST TIME—continued.								
Operating cost for year			$61,719.67		$83,796.53		$60,011.54.	
Average cost per working hour					$11.41		$8.171.	
Value of time lost					$34,238.55		$28,833.98.	
Number of days on which any dredging was done.	14		160		231		235.	
Average time to dredge 1 load	43.1 minutes		3 hours 10 minutes		1 hour 8 minutes		1 hour 6 minutes.	
Average time to dump 1 load	10.6 minutes		15 minutes		5 minutes		3.9 minutes.	
Average time spent going to and from dump per load.	13 minutes		24 minutes		24 minutes		17.7 minutes.	
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
Pay roll	$4,831.78	41.37	$27,346.15	38.90	$29,010.91	32.10	$19,019.85	17.40
Fuel	981.30	8.40	23,079.55	32.80	43,226.21	48.00	29,290.62	26.70
Water	11.00	.09	45.60	.06	120.00	.13	571.15	.53
Supplies:								
Subsistence	1,115.49	9.55	5,306.24	7.50	5,821.01	6.45	5,968.89	5.44
Engine room	305.60	2.62	1,337.55	1.90	1,984.66	2.19	2,622.97	2.60
Miscellaneous	755.37	6.47	1,121.06	1.60	1,350.59	1.41	940.82	.88
Renewals of or additions to outfit	205.03	1.75	3,326.09	4.72	1,054.59	1.17		
Ordinary repairs	2,355.50	20.17	2,656.94	8.90	1,309.18	1.45	5,132.21	4.67
Extraordinary repairs	950.30	8.14	3,332.60	4.72	3,399.39	3.76	[2] 36,864.15	33.80
Towing fuel and supplies to dredge							1,247.00	1.15
Laundry and miscellaneous expenses, wharfage etc.	97.63	.84	158.03	.20	1,228.56	1.36	455.74	.43
Office expense	70.41	.60	2,604.22	3.70	1,800.00	1.98	[3] 6,557.00	5.30
Surveys			None.		None.		1,220.00	1.10
Total cost	$11,679.41	100.00	$70,313.72	100.00	$90,305.10	100.00	[2] $109,784.90	100.00
Cost per cubic yard with no repairs or additions.	$0.2602		$0.0845		$0.036		$0.045.	
Cost per cubic yard with ordinary repairs.	$0.3834		$0.0882		$0.0365		$0.050.	
Total cost per cubic yard	$0.3629		$0.0974		$0.384		$0.056.	

MISCELLANEOUS.				
Fuel consumed during year	377 tons	27,905[illegible] barrels	6,478[illegible] tons	29,481.5 barrels.[4]
Average cost of fuel	$3.54 per ton	$0.75 per barrel	$6.67 per ton	$1.305 per barrel, including storage.
Fuel consumed per yard of dredged material	19.3 pounds		6.168 pounds	4.7 pounds.
Cost of water	$4 per 1,000 gallons	$1 per 1,000 gallons	$0.084 per 1,000 gallons	Cost of pumping only.
Water purchased during year	2,750 gallons	45,000 gallons for cooking and drinking.	1,440,000 gallons	
Remarks.	*Remarks.*	*Remarks.*		*Remarks.*
Operating costs are exclusive of ordinary and extraordinary repairs, additions, and alterations, office expenses and surveys.	The dredge Charleston was engaged in dredging from Aug. 9 to Aug. 24, 1910, and left Sept. 1, 1910, for Charleston, S. C. The cost of repairs and extraordinary repairs was due to preparing the dredge for her trip to Charleston and would probably have been but very little higher for the entire year if she had continued dredging. This, together with the outstanding liabilities from the previous year, was the cause of the high cost of dredging as shown on this report.	[1] Formerly the transport Grant. [2] Remodeled from transport to 20-inch dredge at a cost of $217,724.47 by the Navy Department. [3] From July 1 to Sept. 20, 1910, the dredge was being remodeled at a cost of $137,075. [4] Transferred from the Quartermaster's Department to the Engineer Department, U. S. Army.		[1] During July, August, and September this dredge worked only during the day. During the balance of the year she worked day and night. [2] Special repairs were made to the dredge during the year, amounting to $36,864.15, of which $18,429.44 was paid by the Galveston office and the balance, $18,434.75, by appropriation for improving Cape Fear River, N. C., at and below Wilmington, which was to be paid back to that improvement in rent. To June 30, $5,996.03 had been so paid, leaving a balance of $12,438.72 still due. Only the $5,996.03 paid back in rent is included in the above statement. [3] Paid or to be paid by Galveston office, $36,864.15; rent paid to Galveston office, $10,890; total, $25,974.15. Net cost to Wilmington office, $83,810.75. [4] There were 2,734 barrels of fuel oil on hand June 30, 1911, but as the cost of the oil was included in the cost of the work during the year, it was also included in fuel consumed during the year.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Cumberland.*	*Delaware.*	*Galveston.*	*Gedney.*
Where built	Belfast, Me.	Sparrows Point, Md.	Sparrows Point, Md.	Wilmington, Del.
When built	1902	1905	1908	1887.
Builder	Geo. A. Gilchrist	Maryland Steel Co.	Maryland Steel Co.	Jackson & Sharpe.
Contract cost	$144,750[1]	$358,400	$357,500	$72,500 (purchased in 1892 ready for service).
Cost of outfit	$13,700.12	$33,734	$22,935.35	
Time to build	1 year 1 month	2 years and 2 months	1 year 2 months	
Material of hull	Wood	Steel	Steel	Wood.
Length over all	200 feet	315 feet	304 feet	157 feet.
Length between perpendiculars	183 feet	300 feet	290 feet	149 feet.
Beam	40 feet 8 inches	52 feet	51 feet	36 feet 6 inches.
Depth amidship	20 feet 6 inches	22 feet 6 inches	27 feet	16 feet.
Drafts, light:				
Forward	13 feet 5 inches	11 feet 10 inches	9 feet 6 inches	7 feet.
Aft	14 feet 3 inches	12 feet 6 inches	13 feet 6 inches	16 feet 5 inches.
Drafts, loaded:				
Forward	20 feet 5 inches	18 feet 11 inches	18 feet 5 inches	21 feet.
Aft	19 feet 5 inches	17 feet 7 inches	21 feet 6 inches	16 feet 6 inches.
Displacement:				
Light	1,905 tons	4,000 tons	3,375 tons	1,100 tons.
Loaded	3,577 tons	6,440 tons	7,290 tons	2,250 tons.
Number of hoppers	2	2	2	6.
Total capacity of hoppers	970.29 cubic yards	3,147 cubic yards	2,850 cubic yards	735 cubic yards.
Number of drags	2	2	2	2.
Number size and type:				
Dredging pumps	Two—18-inch centrifugal	Two—20-inch centrifugal	Two—20-inch cast steel, centrifugal.	Two—15-inch Cataract, centrifugal.
Pumping engines	Two—14 and 28 by 16 inch compound.	Two—16 and 32 by 18-inch compound.	Two—20-inch 17 and 36 by 18 open-frame, compound, vertical, direct.	Two—15-inch diameter, 20-inch stroke, simple.
Revolutions per minute of pumping engines	196	162	176	140.
Total indicated horsepower of pumping engines.	660	630	1,124.28	300.
Number, type, and size of propelling engines.	One—22 and 44 by 30 inch compound.	Two—22 and 44 by 30 inch compound.	Two—22 and 46 by 30 inch compound, vertical, direct-acting, open frame, surface condensing.	Two—15 and 26 by 22 inch stroke. compound, condensing.
Revolutions per minute of propelling engines:				
Light	107	106	118	108–110.
Loaded	97	96	118	100.
While dredging	From 30 to 90		25 to 118	30–50.

Total indicated horsepower of propelling engines.	875	1,426	1,088	850.
Average speed:				
Light	10.15 knots	9 knots	10 knots	6.7 knots.
Loaded	8 knots	6 knots	9 knots	5.9 knots.
While dredging	1 to 2 knots	1 to 2 knots	1 knot	0.92 knot.
Number and type of boilers	2 Scotch	4 Scotch, return tubular	4 Scotch, return tubular	2 Scotch.
Dimensions of boilers:				
Diameter	14 feet	14 feet	14 feet 6 inches	12 feet 3 inches.
Length	12 feet	12 feet	12 feet	11 feet.
Heating surface (total)	6,000 feet	10,680 square feet	10,702 square feet	1,740 square feet.
Grate surface (total)	136 feet	280	275 square feet	65 square feet.
Boiler pressure (gauge)	120 to 125 pounds	118 pounds	145 pounds	80 pounds.
Number of men in crew	35	59	34 (single crew)	21.
Operations.				
Location of dredging	(a) Outer bar, (b) Tybee Roads, (c) Long Island Crossing, (d) Tybee Knoll.	Delaware River	Galveston Harbor, Galveston, Tex.	Harbor at Fall River, Mass.
Average depth before dredging	(a) 19.5 feet, (b) 22.5 feet, (c) 20 feet, (d) 22 feet.	25 to 30 feet	32 feet	16.5 feet.
Average depth after dredging	(a) 26 feet, (b) 24.2 feet, (c) 22 feet, (d) 23.9 feet.	30 to 35 feet	33¾ feet	25 feet.
Character of dredging material	(a, b, and c) Sand, mud, gravel, and clay; (d) sand, mud, gravel, clay, and shell.	Sand, mud, clay, gravel	Sand	Soft mud, clayey mud, sand, cobble, shell.
Average distance from work to dump	(a) 1 to 2 miles, (b) 1½ to 2 miles, (c) 1½ to 3 miles, (d) 1 to 8 miles.	9.7 miles	1 mile	8.5 sea miles.
Material dredged during year	667,580 cubic yards	5,116,325 cubic yards [1]	1,759,789 cubic yards	273,138 cubic yards.
Total number of loads	899	969	7270	509.
Average number of loads dredged per day	4.71	3.4	3.4	2.71.
Total amount per load	810.82 cubic yards	1,166 cubic yards [2]	2,420.6 cubic yards	537 cubic yards.
Average amount dredged:				
Per day	3,836.36 cubic yards	18,015 cubic yards	8,223.313 cubic yards	1,453 cubic yards.
Per hour	788.27 cubic yards	856 cubic yards	882.354 cubic yards	441 cubic yards.
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.				
Time at work:				
Pumping	870 hours 49 minutes	3,624.3 hours	1,994 hours 25 minutes	618 hours 41 minutes.
To and from dump	525 hours 37 minutes	1,279.4 hours	279 hours 35 minutes	1,234 hours 19 minutes.
Dumping	96 hours 23 minutes	130.5 hours	176 hours 15 minutes	258 hours 51 minutes.
Taking fuel and supplies	202 hours 34 minutes	546.5 hours	148 hours 46 minutes	169 hours 29 minutes.
To and from wharf or anchorage	226 hours 55 minutes	395.6 hours	172 hours 24 minutes	110 hours 41 minutes.
Total time at work	1,922 hours 18 minutes	5,976.3 hours	2,771 hours 25 minutes	2,392 hours 1 minute.
Total working time in year (less Sundays and holidays).	7,344 hours	7,344 hours	6,804 hours [1]	7,344 hours.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Cumberland.*		*Delaware.*		*Galveston.*		*Gedney.*	
DISTRIBUTION OF TIME AND VALUE OF LOST TIME—continued.								
Time lost from work:								
Bad weather	47 hours 15 minutes		261.7 hours		282 hours 5 minutes		127 hours 18 minutes.	
Ordinary repairs	301 hours 22 minutes		23.8 hours		544 hours 50 minutes		24 hours.	
Extraordinary repairs	1,020 hours		449.7 hours		1,636 hours 50 minutes		867 hours 18 minutes.	
Miscellaneous	4,053 hours 5 minutes		632.5 hours		1,568 hours 50 minutes		3,933 hours 23 minutes.	
Total lost time	5,421 hours 42 minutes		1,367.7 hours		4,032 hours 35 minutes		4,952 hours.	
Operating cost for year	$30,422.14		$83,695.25		$79,439.38		$24,925.56.	
Average cost per working hour	$4.142		$11.39		$11.67		$3.394.	
Value of time lost	$22,456.68		$15,578.10		$47,060.20		$16,807.08.	
Number of days on which any dredging was done.	167		284		214		188.	
Average time to dredge 1 load	58 minutes		49.4 minutes		2 hours 45 minutes		1 hour 21 minutes.	
Average time to dump 1 load	6 minutes		8.4 minutes		14 minutes		31 minutes.	
Average time spent going to and from dump per load.	35 minutes		1.3 hours		do		2 hours 26 minutes.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.								
Pay roll	$13,166.60	16.8	$36,243.61	36.90	$18,452.56	14.65	$13,799.71	39.7
Coal	9,191.71	11.70	33,335.99	34.00	40,176.12	31.91	5,535.70	15.9
Water	137.30	.175			623.11	.50	63.45	.2
Supplies:								
Subsistence	4,020.04	5.12	9,193.27	9.40	5,253.86	4.18	3,718.87	10.7
Engine room	1,574.65	2.00	2,450.12	2.50	3,589.90	2.85	684.09	2.0
Miscellaneous	1,618.65	2.07	1,623.59	1.70	3,358.01	2.66	676.09	1.9
Renewals of or additions to outfit	175.00	.224	610.32	.60	1,204.80	.96	129.65	.4
Ordinary repairs	2,013.71	2.57	3,136.74	3.20	3,028.19	2.41	219.94	.6
Extraordinary repairs	38,710.01	49.50	9,339.86	9.50	38,367.67	30.48	4,160.18	11.9
Alterations and additions to vessels	2,549.47	3.25	792.17	.80			2,275.42	6.6
Laundry and miscellaneous expenses, wharfage, etc.	538.19	.69	238.35	.20	6,781.02	5.39	323.99	.9
Office expenses	4,546.48	5.80	1,200.00	1.20	5,048.14	4.01	2,146.49	6.2
Surveys							1,044.59	3.0
Total cost	$78,241.81	100.00	$98,164.02	100.00	$125,881.38	100.00	$34,772.17	100.0
Cost per cubic yard with no repairs or additions.	$0.0562		$0.0166		$0.04233		$0.1021.	
Cost per cubic yard with ordinary repairs.	$0.0592		$0.0172		$0.04973		$0.1030.	
Total cost per cubic yard	$0.117		$0.0192		$0.07156		$0.1273.	

MISCELLANEOUS.				
Fuel consumed during year	2,387.9 tons coal	10,128.9 tons	89,2[illegible]8 barrels	1,874 tons bituminous.
Average cost of fuel	$3.98 per ton	$3.292 per ton	$1.0739 per barrel	$2.054 per ton.
Fuel consumed per yard of dredged material.	7.8 pounds coal	5.5 pounds	7 pounds	15.4 pounds.
Cost of water	$5 per 1,000 gallons		10.685 cents per 1,000 gallons	90.1 cents per 1,000 gallons.
Water purchased during year	27,460 gallons		5,533,903 gallons	70,475 gallons.
Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	*Remarks.*
Operating costs are exclusive of ordinary and extraordinary repairs, additions and alterations, office expenses and surveys.	[1] $23,423.92 to be added to contract price for sheathing bottom work, copper, etc.	[1] Of the total amount dredged, 1,129,678 cubic yards was dredged and dumped, and 3,986,647 cubic yards was pumped overboard. [2] The average amount per load is computed from the amount dredged and dumped, stated in note above. The material dredged was very soft, and as it was not possible to fill the bins with solid material, only the percentage of solid material was counted in each load.	Dredge worked with single crew in daylight only from Sept. 18, 1911, to end of fiscal year. This report covers period from July 1, 1910, to June 5, 1911. Dredge temporarily transferred to Savannah, Ga., engineer district, on June 5, 1911. Dredge left June 8, 1911. [1] Less 22 days in June.	Water used, 367,975 gallons, mostly furnished, without cost, at the United States naval coaling station, Bradford, R. I.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Key West.*	*Manhattan* (Ambrose Channel).	*Manhattan* (Delaware River).	*Meade, General G. G.*
Where built	Belfast, Me.	Sparrows Point, Md.		Sparrows Point, Md.
When built	1904.	1904.		1904.
Builder	George A. Gilchrist.	Maryland Steel Co.		Maryland Steel Co.
Contract cost	$91,000.	$304,000[1]		$165,000.
Cost of outfit	$10,708.	$37,577.24.		$12,953.
Time to build	1 year 5 months	15 months		1 year 3 months.
Material of hull	Wood.	Steel		Steel.
Length over all	142 feet.	288 feet.		177 feet.
Length between perpendiculars	131 feet.	274 feet.		166 feet.
Beam	31 feet 7 inches.	47 feet 6 inches.		38 feet.
Depth amidship	14 feet 8 inches.	25 feet.		19 feet.
Draft, light:				
Forward	11 feet 8 inches.	10 feet 6 inches.		9 feet.
Aft	11 feet 6 inches.	12 feet 6 inches.		12 feet.
Draft, loaded:				
Forward	17 feet.	21 feet 6 inches.		19 feet.
Aft	15 feet.	do.		17 feet.
Displacement:				
Light	1,000 tons.	2,670 tons.		1,458 tons.
Loaded	1,600 tons.	5,670 tons.		2,596 tons.
Number of hoppers	2.	2.		2.
Total capacity of hoppers	369 cubic yards.	2,476 cubic yards.		935 cubic yards.
Number of drags	1.	2.		2.
Number, size, and type:				
Dredging pumps	One—15-inch centrifugal	Two—20-inch centrifugal		Two—15-inch centrifugal.
Pumping engines	One—12 and 22 by 14 inch compound.	Two—16 and 32 by 18 inch compound.		Two—12 and 22 by 14 inch compound.
Revolutions per minute of pumping engines.	210.	160.		230.
Total indicated horsepower of pumping engines.	190.	670.		400.
Number, type, and size of propelling engines.	One—17.5 and 32 by 24 inch compound.	Two—22 and 44 by 30 inch compound.		Two—15 and 30 by 24 inch compound.
Revolutions per minute of propelling engines:				
Light	106.	104 (average).		110.
Loaded	102.	98 (average).		100.
While dredging	106 to 70.	0 to 60.		60
Total indicated horsepower of propelling engines.	360.	1,390.		731.
Average speed:				
Light	7 knots	9.0 knots.		8.5 knots.
Loaded	5 knots.	7.3 knots.		7 knots.
While dredging	2 knots.	0 to 2.5 knots.		1.5 knots.

Dimensions of boilers:				
Diameter	10 feet 6 inches	14 feet		12 feet.
Length	12 feet	12 feet		13 feet.
Heating surface (total)	2,032 square feet	10,704 square feet		4,124 square feet.
Grate surface (total)	72.5 square feet	280 square feet		125 square feet.
Boiler pressure (gauge)	112 pounds	116 pounds		125 pounds.
Number of men in crew	22	57		87 when coal was used for fuel; 81 at present with fuel oil.
Operations.				
Location of dredging	Key West and Tampa Bay	Ambrose Channel, to Aug. 5, 1910.	Delaware River	Harbors on east shore of Lake Michigan.
Average depth before dredging	16 to 24 feet	30 to 36 feet	25 to 30 feet	12 to 18 feet.
Average depth after dredging	17 to 30 feet	35 to 42 feet	30 to 35 feet	16 to 22 feet.
Character of dredged material	Sand, shell, mud, coral sand	Fine hard sand, 90 per cent; mud and stones, 10 per cent.	Mud, sand, and gravel	Sand, clay, gravel, and stone.
Average distance from work to dump	¾ to 6 miles	10⅛ statute miles	1 to 8 miles	1 to 2 miles.
Material dredged during year	457,501 cubic yards	106,067 cubic yards (July 1–Aug. 5).	4,383,725 cubic yards[1]	466,586 cubic yards.
Total number of loads	1,417	50	956	919.
Average number of loads dredged per day	6	3⅛	3.95	4.74.
Total amount per load	322.86 cubic yards	2,111 cubic yards	1,272 cubic yards[2]	507,656 cubic yards.
Average amount dredged:				
Per day	1,938.56 cubic yards	6,629 cubic yards (16 days)	18,115 cubic yards	2,404.82 cubic yards.
Per hour	360.36 cubic yards	694 cubic yards (152 hours 45 minutes).	1,385 cubic yards	218.62 cubic yards.
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.				
Hours at work:				
Pumping	1,269 hours 35 minutes	152 hours 45 minutes	3,165.9 hours	1,298 hours 2 minutes.
To and from dump	570 hours 40 minutes	113 hours 5 minutes	1,032.4 hours	239 hours 39 minutes.
Dumping	118 hours 5 minutes	9 hours 40 minutes	158 hours	85 hours 55 minutes.
Taking fuel and supplies	122 hours 30 minutes	36 hours	446.6 hour	353 hours 40 minutes.
To and from wharf or anchorage	295 hours 30 minutes	9 hours 45 minutes	331.35 hours	113 hours 12 minutes.
Turning in cut		4 hours 50 minutes		
Total time of work	2,376 hours 20 minutes	326 hours 5 minutes	5,134.25 hours	2,090 hours 28 minutes.
Total working time in year (less Sundays and holidays).	7,344 hours	816 hours	6,552 hours[3]	3,146 hours.
Time lost from work:				
Bad weather	113 hours	20 minutes	209.4 hours	338 hours 10 minutes.
Ordinary repairs	286 hours 55 minutes	406 hours 25 minutes	52.4 hours	463 hours 10 minutes.
Extraordinary repairs	143 hours 50 minutes		552 hours	16 hours 5 minutes.
Alterations and additions				121 hours.
Miscellaneous	4,423 hours 55 minutes	83 hours 10 minutes	603.95 hours	117 hours 7 minutes.
Total lost time	4,967 hours 40 minutes	489 hours 55 minutes	1,417.75 hours	1,055 hours 32 minutes.
Operating cost for year	$32,775.73		$76,016.16	$48,822.12.
Average cost per working hour	$4.462		$14.81	
Value of time lost	$22,165.72		$20,996.88	
Number of days on which any dredging was done.	236	16	242	194.
Average time to dredge 1 load	53.75 minutes	3 hours 3.3 minutes	55 minutes	1 hour 25 minutes.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Key West.*		*Manhattan* (Ambrose Channel).		*Manhattan* (Delaware River).		*Meade, General G. G.*	
DISTRIBUTION OF TIME AND VALUE OF LOST TIME—continued.								
Average time to dump 1 load	5 minutes		11.6 minutes		9.92 minutes		5.6 minutes.	
Average time spent going to and from dump per load.	24.16 minutes		2 hours 15.7 minutes		1.08 hours		15.6 minutes.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.								
Pay roll	$13,099.15	36.91	$6,599.18	21.50	$31,091.48	40.9	$22,401.55	43.07
Coal	10,845.33	30.56	2,555.50	8.35	27,437.48	36.1	[1] 13,065.61	25.575
Fuel oil							[2] 233.17	
Water	592.13	1.67	179.92					
Supplies:				.58				
Subsistence	3,644.75	10.28	2,158.77	7.05	7,971.21	10.4	5,988.10	11.51
Engine room	1,303.91	3.68	237.06	.77	1,569.87	2.1	702.88	1.35
Miscellaneous	767.18	2.11	540.01	1.77	2,774.21	3.6	820.19	1.58
Renewals of or additions to outfit	1,945.28	5.48	3,787.67	12.40	891.05	1.2	423.56	.814
Ordinary repairs	1,228.56	3.47	12,762.21	41.75	1,550.59	2.1	3,801.54	7.31
Extraordinary repairs	917.49	2.59			1,405.00	1.9	658.38	1.26
Alterations and additions to vessel					116.44	.2	235.96	.454
Laundry and miscellaneous expenses, wharfage, etc	578.80	1.63	278.06	.91	108.83	.1	491.18	.944
Office expenses	575.00	1.62	820.55	2.70	1,100.00	1.4	1,948.53	3.75
Surveys			629.28	2.05			[3] 1,232.20	2.37
Total cost	$35,497.58	100.00	$30,548.21	100.00	$76,016.16	100.00	$52,002.85	100.00
Cost per cubic yard with no repairs or additions.	$0.0674		$0.118		$0.0164		$0.0937	
Cost per cubic yard with ordinary repairs.	$0.0700+		$0.274		$0.0168		$0.1018	
Total cost per cubic yard	$0.0776+		$0.288		$0.0173		$0.1048	
MISCELLANEOUS.								
Fuel consumed during year (tons or barrels).	1,742.6 tons		830 tons		8,356.1 tons		2,874.36 tons coal, 49,424 gallons fuel oil.	
Average cost of fuel	$6.223+ per ton		$3.079 per ton		$3.30 per ton		Coal, $3.640 per ton; oil, $0.0235 per gallon.	

Fuel consumed per yard of dredged material.	8.53 pounds		4.27 pounds	Coal, 15.21 pounds; oil, 12 pounds.
Cost of water	$2.20 per 1,000 gallons	25 cents per 1,000 gallons		
Water purchased during year	200,314.5 gallons	719,080 gallons		
Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	
Operating costs are exclusive of ordinary and extraordinary repairs, additions, and alterations, office expenses and surveys.	The Key West was engaged in dredging on the Northwest bar at Key West, Fla., at the beginning of the fiscal year and continued work at that locality until Oct. 25, 1910. On Oct. 26, 1910, the dredge left for Tampa, Fla., arriving on the 27th and began dredging in Hillsboro Bay Oct. 31, 1910. Dredge continued working in this locality until May 27, 1911. On June 1 the dredge left Tampa for Jacksonville, and arrived June 6, and work of general annual overhauling was begun on the following day, and was in progress at the end of the fiscal year.	The Manhattan was leased to the Delaware River, and left New York Aug. 10, 1910. She had previously spent 14 days in repairing and putting in order and 4 days taking inventory and preparing to leave. [1] Total cost, due to changes while building and to fitting out, $361,500.	[1] Of the amount dredged 1,215,672 cubic yards was dredged and dumped, and 3,168,053 cubic yards was pumped overboard. [2] The average amount per load is computed from the amount dredged and dumped, stated in note above. The material dredged was very soft, and as it was not possible to fill the bins with solid material, only the percentage of solid material was counted in each load. [3] The Manhattan operated in the Philadelphia district from Aug. 10, 1910, to the end of the year, a total of 273 working days.	Dredge in winter quarters from Jan. 17 to Mar. 19, 1911. [1] 3,580.5 tons (price includes coaling). [2] 9,972 gallons. [3] Includes engineering contingencies.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Navesink.*	*Raritan.*	*Sabine.*	*Savannah.*
Where built	Sparrows Point, Md.	Sparrows Point, Md.	New York, N. Y.	Sparrows Point, Md.
When built	1908	1908	1901	1904.
Builder	Maryland Steel Co.	Maryland Steel Co.	Townsend & Downey	Maryland Steel Co.
Contract cost	$371,425 [1]	$371,425 [1]	$90,290	$175,500.
Cost of outfit	$12,704.28	$12,704		$19,585.08.
Time to build	10 months	9 months	10 months	1 year and 7 months.
Material of hull	Steel	Steel	Wood	Steel.
Length over all	290 feet	290 feet	145 feet	177 feet.
Length between perpendiculars	276 feet	276 feet	137 feet	166 feet.
Beam	47 feet 6 inches	47 feet 6 inches	35 feet	38 feet.
Depth amidship	28 feet	28 feet	12 feet	19 feet.
Drafts, light:				
Forward	12 feet	12 feet 6 inches	7 feet 4 inches	10 feet.
Aft	14 feet	14 feet 6 inches	9 feet 11 inches	17.5 feet.
Drafts, loaded:				
Forward	22 feet	23 feet 6 inches	do	18 feet.
Aft	23 feet 6 inches	do	12 feet	17 feet.
Displacement:				
Light	3,150 tons	2,930 tons	700 tons	1,461 tons.
Loaded	7,200 tons	5,806 tons	1,100 tons	2,950 tons.
Number of hoppers	2	2	2	2.
Total capacity of hoppers	2,884 cubic yards	2,884 cubic yards [2]	325 cubic yards	935 cubic yards.
Number of drags	2	2	2	2.
Number, size, and type:				
Dredging pumps	Two—20-inch centrifugal	Two—20-inch centrifugal	Two—10-inch centrifugal	Two—15-inch centrifugal.
Pumping engines	Two—17 and 36 by 18 inch compound.	Two—17 and 36 by 18 inch compound.	Two—horizontal simple (starboard, 10$\frac{5}{32}$ by 11 inch stroke; port, 10$\frac{1}{8}$ by 11 inch stroke).	Two—12 and 22 by 14 inch compound.
Revolutions per minute of pumping engines.	155	150	277	245.
Total indicated horsepower of pumping engines.	921, on trials May 29, 1908, with 125 pounds steam.	Builder's trials, April, 1908, with 125 pounds steam, 926; test Dec. 13, 1910, with 110 pounds steam, 808.	Starboard, 51; port, 57	520.
Number, type, and size of propelling engines.	Two—22 and 46 by 30 inch compound.	Two—22 and 46 by 30 inch compound.	Two—vertical compound, starboard, 13$\frac{1}{16}$ and 27$\frac{1}{16}$ by 18 inch stroke; port, 13$\frac{1}{16}$ and 27$\frac{3}{8}$ by 18 inch stroke.	Two—15 and 30 by 24 inch compound.
Revolutions per minute of propelling engines:				
Light	99	112	124	120.
Loaded	93 to 95	110	118	108.
While dredging	0 to 60	0 to 60	78	From 30 to 90.

Total indicated horsepower of propelling engines.	1,844, on trials May 28, 1908, with 127 pounds steam.	Builder's trials, April, 1908, with 128 pounds steam, 1,804; test, Dec. 18, 1910, with 110 pounds steam, 1,513.	880	710.
Average speed:				
Light	9.6 knots	9.2 knots	8.5 knots	9.25 knots.
Loaded	7.6 knots	7.4 knots	7.7 knots	7.74 knots.
While dredging	0 to 2.5 knots	0 to 2.5 knots	3.0 knots	1 to 2 knots.
Number and type of boilers	4 Scotch marine	4 Scotch	2 Scotch marine	2 Scotch.
Dimensions of boilers:				
Diameter	14 feet 6 inches	14 feet 6 inches	9 feet 6 inches	13 feet.
Length	12 feet	12 feet	10 feet	12 feet.
Heating surface (total)	10,460 square feet (for 4 boilers)	10,460 square feet (for 4 boilers)	871.7 square feet	5,012 square feet.
Grate surface (total)	273 square feet (for 4 boilers)	273 square feet (for 4 boilers)	34 square feet	125 square feet.
Boiler pressure (gauge)	119 pounds to June, 1911; 114 pounds since.	113 (average)	110 pounds	120 to 125 pounds.
Number of men in crew	59	59	17	34.
Operations.				
Location of dredging	Ambrose Channel; Coney Island Channel.	Ambrose Channel; Coney Island Channel.	Sabine Pass Jetty Channel, Tex. and La.	(a) Outer bar, (b) quarantine, (c) lower flats, (d) upper flats, (e) Tybee Knoll, (f) Tybee Roads, (g) Long Island Crossing.
Average depth before dredging	Ambrose Channel, 30 to 36 feet; Coney Island Channel, 12 to 18 feet.	Ambrose Channel; 30 to 36 feet; Coney Island Channel, 12 to 18 feet.	24 feet	(a) 19.5 feet, (b) 19 feet, (c) 21.6 feet, (d and e) 22 feet, (f) 25 feet, (g) 21 feet.
Average depth after dredging	Ambrose Channel, 35 to 40 feet; Coney Island Channel, 15 to 22 feet.	Ambrose Channel, 35 to 40 feet; Coney Island Channel, 15 to 22 feet.	25.5 feet	(a) 26 feet, (b) 22 feet, (c) 22.7 feet, (d) 22.5 feet, (e) 24 feet, (f) 25 feet, (g) 22.3 feet.
Character of dredged material	95 per cent sand, 5 per cent mud and stone.	95 per cent sand, 5 per cent mud and stone.	Soft blue mud and silt	(a) Fine sand (b and d), coarse sand, (c and e) coarse sand and clay, (f) fine sand, clay, and mud, (g) fine sand, clay, and mud.
Average distance from work to dump	Ambrose Channel, 10.5 statute miles; Coney Island Channel, 12.5 statute miles.	Ambrose Channel, 10.5 statute miles; Coney Island Channel, 12.5 statute miles.	1.5 miles	(a and d) ½ to 2 miles, (b) ½ to 1 mile, (c) 1 mile, (e) ½ to 7 miles, (f) 3 miles, (g) 1 to 2 miles.
Material dredged during year	2,576,237 cubic yards [1]	2,499,231 cubic yards [2]	507,487.5 cubic yards	721,193 cubic yards.
Total number of loads	983	963	1,735	946.
Average number of loads dredged per day	3.36 (292 days)	3.23	8.9433	432.
Average amount per load	2,621 cubic yards	2,595 cubic yards	292.5 cubic yards	762.36 cubic yards.
Average amount dredged:				
Per day	8,822 cubic yards (292 days)	8,387 cubic yards (298 days)	2,615.91 cubic yards	3,293.1 cubic yards.
Per hour	821.7 cubic yards (3,135 hours 5 minutes).	770.6 cubic yards (3,243 hours 5 minutes).	550.767 cubic yards	274.4 cubic yards.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Navesink.*	*Raritan.*	*Sabine.*	*Savannah.*
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.				
Time at work:				
Pumping	3,135 hours 5 minutes	3,243 hours 5 minutes	921 hours 25 minutes	1,248 hours 16 minutes.
To and from dump	2,112 hours 5 minutes	2,182 hours 10 minutes		549 hours 29 minutes.
Dumping	165 hours 15 minutes	161 hours 25 minutes	143 hours 45 minutes	149 hours 37 minutes.
Taking fuel and supplies	600 hours	600 hours	59 hours 35 minutes	240 hours 17 minutes.
To and from wharf or anchorage	146 hours 5 minutes	144 hours 40 minutes	782 hours 30 minutes	289 hours 15 minutes.
Turning in cut	218 hours 50 minutes	157 hours 20 minutes		
Total time at work	6,377 hours 20 minutes	6,488 hours 40 minutes	1,907 hours 15 minutes	2,476 hours 54 minutes.
Total working time in year (less Sundays and holidays).	7,344 hours	7,344 hours	7,344 hours	7,344 hours.
Time lost from work:				
Bad weather	138 hours 20 minutes	159 hours 5 minutes	519 hours 15 minutes	36 hours 25 minutes.
Ordinary repairs	548 hours 20 minutes	384 hours 30 minutes	239 hours 40 minutes	56 hours 21 minutes.
Extraordinary repairs	257 hours	254 hours 20 minutes	}504 hours	769 hours 50 minutes.
Alterations and additions				
Miscellaneous	23 hours	57 hours 25 minutes	4,173 hours	4,005 hours 30 minutes.
Total lost time	966 hours 40 minutes	855 hours 20 minutes	5,436 hours 45 minutes	4,867 hours 6 minutes.
Operating cost per year	$98,577.75	$94,334.11	$20,988.56	$37,267.69.
Average cost per working hour	$13.42	$12.83	$2.858	$5.074.
Value of time lost	$12,972.71	$10,973.88	$15,382.23	$24,695.67.
Number of days on which any dredging was done.	292	298	194	218.
Average time to dredge 1 load	3 hours 11 minutes	3 hours 22 minutes	31.86 minutes	1 hour 19 minutes.
Average time to dump 1 load	10 minutes	10 minutes	5 minutes	9.5 minutes.
Average time spent going to and from dump per load.	2 hours 9 minutes	2 hours 16 minutes	Approximately 25 minutes	34.8 minutes.

	Navesink.		*Raritan.*		*Sabine.*		*Savannah.*	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.								
Pay roll	$36,294.45	29.10	$37,213.55	31.82	$10,949.00	30.698	$16,625.32	27.70
Coal	34,842.38	27.94	33,051.00	28.87			11,082.48	18.40
Fuel oil					5,354.14	15.012		
Water	468.50	.40	577.90	.49	500.00	1.402	222.00	.36
Supplies:								
Subsistence	11,048.04	8.86	11,080.59	9.48	2,181.37	6.104	4,842.64	8.05
Engine room	1,987.64	1.59	1,570.45	1.34	}873.63	2.449	1,636.00	2.73
Miscellaneous	4,456.82	3.58	3,097.51	2.65			2,041.75	3.40

Renewals of or addition to outfit	7,311.57	5.86	5,864.48	5.02	398.44	1.117	230.85	.38
Ordinary repairs	7,406.66	5.94	3,882.89	3.32	268.06	.751	2,906.77	4.84
Extraordinary repairs					13,199.71	37.016	15,609.88	26.00
Alterations and additions to vessel								
Laundry and miscellaneous expenses, wharfage, etc	2,159.91	1.73	1,875.68	1.60	463.90	1.307	586.65	.97
Office expenses	7,385.01	5.92	7,385.01	6.32	1,478.00	4.144	4,301.95	7.17
Surveys	11,320.94	9.08	11,320.94	9.69				
Total cost	$124,690.91	100.00	$116,926.95	100.00	$35,666.27	100.000	$60,084.79	100.00

Cost per cubic yard with no repairs or additions.	$0.0354	$0.0378	$0.0429	$0.0576.
Cost per cubic yard with ordinary repairs.	$0.0411	$0.0394	$0.0443	$0.0616.
Total cost per cubic yard	$0.0484	$0.0468	$0.0703	$0.0833.
MISCELLANEOUS.				
Fuel consumed during year	11,440.4 tons	10,862 tons	6,257.71 barrels	2,841.4 tons coal
Average cost of fuel	$3.046 per ton	$3.048 per ton	90 cents per barrel	$3.90 per ton.
Fuel consumed per yard of dredged material.	9.94 pounds	9.73 pounds	4 pounds	8.8 pounds.
Cost of water	25 cents per 1,000 gallons	25 cents per 1,000 gallons	$2.315 per 1,000 gallons	$5 per 1,000 gallons.
Water purchased during year	1,874,000 gallons	2,311,600 gallons	253,916 gallons	44,400 gallons.
Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	
Operating costs are exclusive of ordinary and extraordinary repairs, additions and alterations, office expenses, and surveys.	[1] Total cost, including alterations necessary for efficient work, $393,340. [2] Hoppers even full. [3] Ambrose Channel, 2,514,881 cubic yards; Coney Island Channel, 61,356 cubic yards.	[1] Total cost, including alterations necessary for efficient work, $397,600. [2] Ambrose Channel, 2,432,662 cubic yards; Coney Island Channel, 61,761 cubic yards; main ship and other channels, 4,808 cubic yards.	Machinery of dredge was completely overhauled during year. All steam cylinders rebored and all crank shafts rebabbitted, etc. [1] Contract price ..... $87,900.00 Extra copper sheathing ..... 2,390.00 Total ..... $90,290.00 Amount deducted for failure to deliver on time ..... 5,436.60 Actual cost $84,853.40	

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*St. Johns.*	*Sumter.*	*Winyah Bay.*
Where built	Greenport, R. I	Petersburg, Va	Wilmington, Del.
When built	1905	1904	1898.
Builder	James Reiley Repair & Supply Co	Petersburg Iron Works	The Bucyrus Co.
Contract cost	$150,000	$144,300	$73,800.
Cost of outfit	$26,000	$7,534.14	$12,200.
Time to build	2 years	3 years	11 months.
Material of hull	Wood	Oak, yellow pine, and hackmatac	Oak frame, oak and pine planking.
Length over all	206 feet 6 inches	200 feet	141 feet.
Length between perpendiculars	191 feet 6 inches	185 feet	136 feet.
Beam	41 feet 4 inches	41 feet	31 feet 6 inches.
Depth amidship	20 feet	22 feet	13 feet 6 inches.
Draft, light:			
Forward	13 feet 6 inches	13 feet	7 feet.
Aft	14 feet 6 inches	13.9 inches	9 feet.
Draft, loaded:			
Forward	21 feet	21 feet	13 feet.
Aft	21 feet 3 inches	do	Do.
Displacement:			
Light	2,011 tons	1,706.22 tons	831 tons.
Loaded	3,300 tons	2,664.09 tons	1,299 tons.
Number of hoppers	2	2	2.
Total capacity of hoppers	1,000 cubic yards	964 cubic yards	306 cubic yards.
Number of drags	2	2	1.
Number, size, and type:			
Dredging pumps	Two—18-inch centrifugal	Two—18-inch centrifugal, Edwards make	One—15-inch Bucyrus Co. make.
Pumping engines	Two—14 and 26 by 18 inch compound	Two—14 and 26 by 18 inch stroke, fore-and-aft compound.	One—12 and 22 by 14 inch fore-and-aft compound.
Revolutions per minute of pumping engines	175	200	225.
Total indicated horsepower of pumping engines.	590	730	250.
Number, type, and size of propelling engines	1 compound, 22 and 44 by 30 inches	1 fore-and-aft compound, 22 and 44 by 30 inch stroke.	1 fore-and-aft compound, 17 and 32 by 24 inch stroke.
Revolutions per minute of propelling engines:			
Light	104	90	115.
Loaded	85	85	108.
While dredging	70 to 104	30 (average)	75.
Total indicated horsepower of propelling engines.	775	700	400.
Average speed:			
Light	9 knots	8 knots	9 knots.
Loaded	5 knots	5 knots	8 knots.
While dredging	1 knot	1 knot	1 and 2 knots.
Number and type of boilers	2 Scotch return tube	2 Scotch; three 42-inch furnaces; 280 tubes, 3¼ inches diameter.	1 Scotch marine.

Dimensions of boilers:			
Diameter	14 feet	14 feet	13 feet 6 inches.
Length	12 feet	12 feet	12 feet
Heating surface (total)	2,696 square feet each, total, 5,392 square feet.	5392 square feet	2,500 square feet.
Grate surface (total)	73.5 square feet each; total, 147 square feet.	170 square feet	73.5 square feet.
Boiler pressure (gauge)	115 pounds	120 pounds	115 pounds.
Number of men in crew	39	40	24.
Operations.			
Location of dredging	St. Johns River at mouth	Outer bar Southwest Pass, La., Charleston Harbor, S. C.	Charleston Harbor, S. C.
Average depth before dredging	20 to 30 feet	16 to 28 feet (Charleston Harbor)	16 to 28 feet.
Average depth after dredging	24 to 30 feet	18 to 28 feet (Charleston Harbor)	18 to 28 feet.
Character of dredged material	Sand, broken shell, sand and shell	Sand, mud, clay, and shell	Fine hard sand.
Average distance from work to dump	1½ to 3 miles	1 mile Southwest Pass, La.; ¾ mile (Charleston Harbor).	¾ mile.
Material dredged during year	821,321 cubic yards	121,739 cubic yards Southwest Pass, La.; 552,043 cubic yards Charleston Harbor, S. C.	313,651 cubic yards.
Total number of loads	908	879	1,341.
Average number of loads dredged per day	4.85+	5.3	7.13.
Total amount per load	904.53+ cubic yards	766.5 cubic yards	233.9 cubic yards.
Average amount dredged:			
Per day	4,392.1 cubic yards	4,059.5 cubic yards	1,669 cubic yards.
Per hour	925.8 cubic yards	591.8 cubic yards	247.3 cubic yards.
DISTRIBUTION OF TIME AND VALUE OF LOST TIME.			
Time at work:			
Pumping	887 hours 10 minutes	1,138 hours 32 minutes	1,228 hours 5 minutes.
To and from dump	663 hours 49 minutes	326 hours 26 minutes	308 hours 25 minutes.
Dumping	135 hours 3 minutes	106 hours 21 minutes	108 hours 15 minutes.
Taking fuel and supplies	32 hours 37 minutes	66 hours 19 minutes	18 hours 35 minutes.
To and from wharf or anchorage	332 hours 46 minutes	339 hours 12 minutes	338 hours 55 minutes.
Total hours at work	2,051 hours 25 minutes	1,976 hours 50 minutes	2,002 hours 15 minutes.
Total working time in year (less Sundays and holidays).	7,344 hours	7,344 hours	7,344 hours.
Time lost from work:			
Bad weather	208 hours 57 minutes	220 hours 8 minutes	125 hours 30 minutes.
Ordinary repairs	9 hours 9 minutes	42 hours 18 minutes	167 hours 50 minutes.
Extraordinary repairs	945 hours 30 minutes	1,425 hours 21 minutes	842 hours.
Miscellaneous	4,129 hours	3,679 hours 23 minutes	6,211 hours 20 minutes.
Total lost time	5,292 hours 35 minutes	5,367 hours 10 minutes	5,341 hours 45 minutes.
Operating cost per year	$45,155.30	$43,415.96	$20,837.01.
Average cost per working hour	$6.148	$5.9117	$2.837.
Value of time lost	$32,538.29	$31,729.04	$15,154.54.
Number of days on which any dredging was done.	187	166	182.
Average time to dredge 1 load	58.62 minutes	1 hour 17 minutes	56 minutes.

TABLE I.—*Performance of United States seagoing dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*St. Johns.*		*Sumter.*		*Winyah Bay.*	
DISTRIBUTION OF TIME AND VALUE OF LOST TIME—continued.						
Average time to dump 1 load	8.92 minutes		7 minutes		5 minutes.	
Average time spent going to and from dump per load.	43.86 + minutes		22 minutes		14 minutes.	
	Amount.	Per cent.	Amount.	Per cent.	Amount.	Per cent.
DISTRIBUTION OF COST AND PERCENTAGE OF TOTAL COST.						
Pay roll	$20,959.98	22.49	$22,174.65	33.00	$10,852.00	31.5
Coal	14,176.01	15.21	9,461.88	14.00	4,420.64	12.8
Water			214.77	.3	208.70	.6
Supplies:						
Subsistence	6,499.15	6.97	7,025.97	10.4	2,531.72	7.3
Engine room	1,146.15	1.23	2,082.49	3.08	843.90	2.5
Miscellaneous	1,129.66	1.21	1,906.84	2.8	1,071.18	3.1
Renewals of or additions to outfit	478.00	.52	13.17	.02	320.88	.9
Ordinary repairs	1,520.50	1.63	479.97	.7	3,967.60	11.5
Extraordinary repairs	42,994.90	46.13	20,155.40	29.9	7,320.83	21.2
Alterations and additions to vessel	2,348.63	2.52				
Laundry and miscellaneous expenses, wharfage, etc.	766.38	.82	1,536.79	2.3	587.89	1.7
Office expenses	1,189.40	1.27	1,700.10	2.5	1,700.10	4.9
Surveys			666.66	1.00	666.66	2.00
Total cost	$93,203.73	100.00	$67,418.09	100.00	$34,482.10	100.00
Cost per cubic yard with no repairs or additions.	$0.0534		$0.0694		$0.0654.	
Cost per cubic yard with ordinary repairs	$0.0553		$0.0701		$0.07802.	
Total cost per cubic yard	$0.1135		$0.10+		$0.1099.	
MISCELLANEOUS.						
Fuel consumed during year	3,127 tons		2,309 tons		1,150 tons.	
Average cost of fuel	$4.533 per ton		$4.09 per ton		$3.56 per ton.	
Fuel consumed per yard of dredged material.	8.54 pounds		7.67 pounds		7.57 pounds.	
Cost of water			$10 and $25[1] per 1,000 gallons, respectively		$10 and $25[1] per 1,000 gallons, respectively.	
Water purchased during year			1,122,784 gallons		399,653 gallons.	

Remarks.

Operating costs are exclusive of ordinary and extraordinary repairs, additions and alterations, office expenses, and surveys.

Remarks.

The *St. Johns* arrived in this district from New Orleans July 10, 1910, and began dredging on St. Johns Bar on July 14 and continued work until Aug. 7 and underwent repairs to stem on that date. Work was resumed on Aug. 29 and was continued until Mar. 31, 1911, when the breaking of the crank shaft to one of the pumping engines necessitated repair; this opportunity was taken advantage of to make the annual overhauling, which resulted in practically rebuilding the hull to about 25 per cent of its first cost, or at an expense of over $36,000. Work was resumed on June 24, 1911, at the mouth of St. Johns River.

Remarks.

Time lost for extraordinary repairs includes time undergoing repairs at navy yard, Charleston, S. C., from Jan. 10, 1911, to May 6, 1911. The miscellaneous time lost includes 6 days from New Orleans to Charleston, S. C., in August, 1910.

[1] Drinking water.

Remarks.

[1] Drinking water.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911.*

Name	*Barnard.*	*Blackwater.*	*Cataract.*	*Congaree.*
When built	1904	Completed June 20, 1911	1905	1907-8.
Where built	Camden, N. J	Pine Barren, Fla.	Baltimore, Md	Georgetown, S. C.
Builder	New York Ship Building Co	U. S. Engineer Department	Ellicott Machine Co	U. S. Engineer Department.
Time to build		11½ months to build and install machinery.		15 months.
Material of hull	Steel	Wood	Wood	Wood.
Contract cost	$230,000		$80,600	$30,200.
Cost of outfit		$63,289.23	$14,211.48	$1,485.
Length	206 feet 2 inches	110 feet	140 feet 6 inches	110 feet 10 inches.
Beam	38 feet	32 feet	40 feet 4 inches	32 feet 6 inches.
Depth	14 feet	9 feet 4 inches	10 feet 7 inches	6 feet.
Number, size, and type of propelling engines.	Two—12 and 18 and 30 by 18 inch triple expansion.	None		None.
Number, size, and type of pumping engines.	One—21 and 32 and 54 by 26 inch triple expansion.	One—12 and 24 by 14 inch stroke inverted compound condensing.	One 12 and 22 and 33 by 20 inch triple expansion.	One—10 and 20 by 10 inch fore-and-aft compound.
Boilers:				
Number and type	2 Scotch marine	2 Scotch marine	3 Scotch marine, donkey	2 locomotive.
Length	18 feet	14 feet 5 inches	12 feet 6 inches	21 feet 1 inch.
Diameter	11 feet	8 feet	7 feet	5 feet.
Heating surface (total)	4,686 square feet	2,200 square feet		987 square feet each boiler.[1]
Grate surface (total)	172 square feet	48 square feet		27 square feet each boiler.[1]
WORK PERFORMED.				
District to which dredge belongs	Mobile	Montgomery, Ala	Philadelphia	Charleston.
Location of dredging	Gulfport Harbor	Narrows in Santa Rosa Sound, Fla.	Delaware River	Congaree River, S. C.
Depth before dredging, average	18 feet	No work performed by this dredge previous to June 30, 1911.	Rehandling	
Depth after dredging, average	24 feet			
Character of material dredged	Mud	Will be sand and sand and mud	Sand, stone, clay, gravel, and mud.	Sand.
Rate of advance per hour	1,320 feet	No work performed to date		From 14 feet to 60 feet.
Amount dredged during year	1,156,938 cubic yards		1,398,069 cubic yards	About 100,000 cubic yards.
Average amount dredged:				
Per hour	1 030.7 cubic yards	No work performed to date	326.27 cubic yards	Not known; dredging very irregular.
Per day	9,330.1 cubic yards	do	6 383 cubic yards	
PLANT.				
Discharge pipe in use	600 to 800 feet	500 feet	3,000 feet	29 sections of 20 feet each.
Diameter of discharge pipe	36 inches	15 inches	20 inches	12 inches.
Number of pontoons in use	28	21	30	29.

Revolutions per minute:				
Propelling engines	175	None		None.
Pumping engines	120	Not operated to date	180	210.
Type of agitator on cutter head	None	Cutter head; spiral type	Built-up	
Type of suction head	Drag	Suction from within cutter head	None	Flanged out to 16 by 18 inches.
Revolutions per minute of cutter head	None		20	7.
Average boiler pressure (gauge)	170 pounds	Will be about 100 to 120 pounds	180 pounds	105 pounds.
Kind of coal used	Bituminous	Bituminous	Semibituminous	None.
Average vacuum in suction pipe	9 inches		20 inches	10 inches.
Average gauge pressure in discharge pipe	5 pounds		24 pounds	10 pounds.
Draft of dredge:				
Forward	9 feet 6 inches	5 feet 2 inches	6 feet 2 inches	2 feet 9 inches.
Aft	10 feet 10 inches	4 feet 8 inches	6 feet 6 inches	3 feet.
Displacement of dredge	1,291 tons	465 long tons, 16,275 cubic feet	886 tons	About 250 tons.
Number of crew	41		35	12.
TOWBOATS.				
Name of tug attached to dredge	C. Donovan	None to date	None attached	None.
Number of crew	9			Do.
Displacement	Not known			
Draft:				
Forward	7 feet			
Aft	10 feet			
LAUNCHES.				
Name		Arrow (gasoline launch, Fort Pickens).	Dorothy	Columbia.
Length		31 feet 6 inches	22 feet 6 inches	30 feet.
Beam		7 feet 4 inches	6 feet 8 inches	6 feet.
Depth		3 feet 5 inches	36 inches	1 foot 11 inches.
Draft		1 foot 6 inches	18 inches	4 inches.
Displacement		1.75 tons	2 tons	¼ ton.
BARGES.				
Number of barges in use	1	1	1	1 small wood lighter. Lighter E.
Usage	Coal	Quarter boat	Coal scow	Handling wood.
Displacement, light	104 tons		103.5 tons	7 tons.
Capacity of all barges	340 tons		80 to 90 tons	30 tons.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	1,122 hours 48 minutes	No work to date	4,301.9 hours	Not known.
Handling pipe line		do	174.8 hours	Do.
Handling swinging wires		do	2.5 hours	Do.
Going to and from wharf and anchorage	14 hours 10 minutes	do		Anchors in stream.
Placing dredge	90 hours 43 minutes	do	12 hours	
Waiting for vessels to pass	5 hours 43 minutes	do		Waiting rarely necessary.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Barnard.*	*Blackwater.*	*Cataract.*	*Congaree.*
DISTRIBUTION OF TIME LOST.				
Changing location of plant		No work to date	81.75 hours	Not known.
Bad weather	4 hours 7 minutes	do	694.65 hours	Do.
Washing boilers and ordinary repairs	313 hours 40 minutes	do	303.85 hours	Do.
Extraordinary repairs	6 hours	do	936 hours	Do.
Other causes	69 hours 9 minutes	do	836.75 hours	Do.
Sundays and holidays	402 hours	do	1,416 hours	Do.
COST OF WORK.				
Dredge.				
Pay rolls	$14,456.63	No work performed	$18,198.98	$4,010.90
Coal for boilers	14,080.88		6,908.73	[2] 1,019.38
Coal for galley	64.60			
Water				(3)
Supplies, subsistence	4,468.03		4,554.54	1,162.17
Supplies, engine room	1,691.50		1,655.35	151.28
Other supplies	2,961.97		1,654.79	226.32
Renewals or additions to outfit	3,861.62		6,151.96	157.50
Ordinary repairs	1,379.57		780.56	218.93
Exceptional: Getting pontoons from Georgetown, S. C.				365.39
Laundry, ice, miscellaneous expenses	379.63		47.75	75.20
Total office charges				3.354.82
Total	$43,344.43		$39,952.66	$10,741.89
Towboats and launches.				
Pay rolls	2.758.77	No work performed		(4)
Coal for boiler	835.38			
Coal for galley	19.40			
Supplies, subsistence	659.52			
Supplies, engine room	224.20			
Launch supplies			32.40	[5] 365.22
Renewals of or additions to outfit	26.46			
Ordinary repairs			2.00	
Laundry, ice, miscellaneous expenses, etc.	9.95			None.
Total	$4,533.68		$34.40	$365.22

Barges.				
Ordinary repairs to barges	90.08	No work performed		None.
Total field cost	$47,958.79		$39,987.06	None.
Total field cost per cubic yard	4.15 cents		$0.0286	None.
Office expenses, superintendence, surveys, etc.	5,969.02		1,930.00	None.
Extraordinary repairs to dredge			3,103.74	None.
Extraordinary repairs to towboats and launches.	999.38		6.50	None.
Extraordinary repairs to barges				None.
Total	$54,927.19		$45,027.30	None.
Miscellaneous.				
Gross cost per cubic yard	4.75 cents	No work performed	3.22 cents	Field, 7.73 cents; field and office, 11.08 cents.
Fuel consumed by dredge	3,886.1 tons		2,435.75 tons	500 cords wood (7 working months).
Fuel consumed by auxiliary plant	234.8 tons		6 barrels gasoline	None.
Cost of fuel	$3.64 per ton		$2.90 per ton, $5.40 per barrel	Wood, $2 per cord on river bank.
Water purchased	None			None.
Cost of water				Nothing.
	Remarks.	***Remarks.***		***Remarks.***
	Dredging was done from beginning of year to Dec. 10, 1910. From Dec. 10 to 16, dredge was undergoing repairs and making preparation to go to Habana, Cuba, for which place she sailed Dec. 17, 1911.	Dredge Blackwater, to be employed dredging in narrows in Santa Rosa Sound, Fla.; Blackwater River, Fla., and St. Andrews Bay, Fla., beginning July 1, 1911.		The yardage is from rough estimate. [1] Boilers used alternately. [2] Uses wood. [3] No cost, except pumping and condensing. [4] No separate account; 1 man used irregularly and charged with crew. [5] Total cost.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Dalecarlia.*	*Delatour.*	*Epsilon.*	*Etna.*
When built	1908	1908–9	1898	1908–9.
Where built	Dalecarlia Reservoir, D. C	Jeffersonville, Ind	Grafton, Ill	Des Moines Rapids Canal.
Builder	Wetherill Bros. Machine Co	M. A. Sweeney Shipyard & Foundry Co.	Springfield Boiler & Manufacturing Co.	United States.
Time to build	5 months	18 months	15 months	About 9 months.
Material of hull	Wood	Pine	Steel	Wood.
Contract cost	$26,400	$39,812.45	$102,000	$29,733.[1]
Cost of outfit	In or above contract price	$1,000	$3,000 (approximate)	[1]
Length	66 feet	112 feet; over all 162 feet 2 inches.	157 feet	130 feet.
Beam	24 feet	30 feet	40 feet	28 feet.
Depth	6 feet	5 feet	7 feet 6 inches	5 feet.
Number, size, and type of propelling engines.	None	Two—12 by 48 inch lever, poppet valve, cal. cut-off, horizontal engines.	None	None.
Number, size, and type of pumping engines.	One—10 and 20 by 10 inch compound d. c. to 10-inch centrifugal pump.	1 compound condensing, Morris vertical, size 12 and 22 by 14 inches.	Two 16 and 26 by 18 inches, horizontal tandem compound.	Ball compound engine 12 and 23 inch bore by 16-inch stroke.
Boilers:				
Number and type	One 150-horsepower Worthington water tube.	2 flue type boilers	6 Mississippi River	3 boilers with five to 8-inch flues each.
Length	10 feet 9⅛ inches long, 8 feet 9 inches wide, 10 feet ¾ inch high.	20 feet	28 feet	20 feet.
Diameter	Steam drum 36 inches diameter, 12 feet 2½ inches long.	40 inches	48 inches	40 inches.
Heating surface (total)	1,349.72 square feet	949.75 square feet	3,000 square feet	1,166 square feet.
Grate surface (total)	40.1 square feet	38 square feet	143 square feet	48.75 square feet.
WORK PERFORMED.				
District to which dredge belongs	Washington, D. C	New Orleans, La., district	Mississippi River Commission	Rock Island, Ill.
Location of dredging	No work during fiscal year	See remarks	Mississippi River below Cairo	See remarks.
Depth before dredging, average			See remarks	2.2 to 4 feet.
Depth after dredging, average			do	5.7 to 9 feet.
Character of material dredged			Sand, gravel, silt, and small drift.	Sand, mud, and gravel.
Rate of advance per hour		21.6 feet	270 feet	12½ to 16 feet.
Amount dredged during year		163,118.30 cubic yards	271,076 cubic yards	315,750 cubic yards.
Average amount dredged:				
Per hour		182.25 cubic yards	920 cubic yards	146 to 212 cubic yards.
Per day		1,394.17 cubic yards		2,200 to 2,920 cubic yards.
PLANT.				
Discharge pipe in use		260 feet	600 feet	500 to 1,100 feet.
Diameter of discharge pipe		13 inches	32 inches	18 inches.
Number of pontoons in use		7	12	12.
Revolutions per minute:				
Propelling engines	No propelling engines	18	None	None.
Pumping engines	205	195	160	[illegible]

Type of agitator or cutter head	48-inch diameter revolving, 6 cast-steel blades.	Wetherill Bros., half oval shape.	Water-jet agitator	None.
Type of suction head	10-inch pipe rubber connections.	12-inch gas pipe	Upstream with water jets	Plain square.
Revolutions per minute of cutter head	18	25		None.
Average boiler pressure (gauge)	100 pounds	140 pounds	125 pounds	140 pounds.
Kind of fuel used		Fuel oil	Pittsburgh, bituminous coal	Bituminous coal.
Average vacuum in suction pipe	16 inches	20 inches	8 inches	17 inches.
Average gauge pressure in discharge pipe	15 pounds	Not known	13 pounds	14 pounds.
Draft of dredge:				
Forward	3 feet	3 feet 7 inches	3 feet 8 inches, 5 feet from bow	2.6 feet.
Aft	do	do	4 feet 8½ inches, 2 feet from stern	Do.
Displacement of dredge	132 tons	350 tons	650 tons	266 tons.
Number of crew	5	15	35	16.
TOWBOATS.				
Name of tug attached to dredge	None		Leota	No boat regularly attached to dredge.
Number of crew			11	
Displacement			560 tons	
Draft:				
Forward			4 feet, 27½ feet from bow	
Aft			4 feet 7 inches, 26 feet from stern	
LAUNCHES.				
Name	None			
Length				
Beam				
Depth				
Draft				
Displacement				
BARGES.				
Number of barges in use	None		1	3.
Usage			Coal	Fuel and pipe.
Displacement, light				150 tons.
Capacity of all barges			600 tons	375 tons.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	No work during fiscal year	895 hours	294 hours	1,666 hours.
Handling pipe line				362 hours.
Handling swinging wires				
Going to and from wharf and anchorage		Other works 776 hours 28 minutes.		
Placing dredge			105 hours	264 hours.
Waiting for vessels to pass			None	6 hours.
DISTRIBUTION OF TIME LOST.				
Changing location of plant	No work during fiscal year	Under way 246 hours 38 minutes.		419 hours.
Bad weather		59 hours 50 minutes		6 hours.
Washing boilers and ordinary repairs		156 hours 15 minutes	73 hours	168 hours.
Extraordinary repairs		822 hours 55 minutes		28 hours.
Other causes		51 hours 37 minutes		574 hours.
Sundays and holidays		404 hours 30 minutes		820 hours.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Dalecarlia.*	*Delatour.*	*Epsilon.*	*Etna.*
COST OF WORK.				
Dredge.				
Pay rolls		$8,728.02	$8,839.07	$8,319.16
Oil for boilers		2,636.60		
Coal for boilers		235.05	7,174.14	4,887.95
Coal for galley			44.00	
Water				
Supplies, subsistence		2,635.39		1,525.18
Supplies, engine room				321.20
Other supplies		1,605.28		165.47
Renewals or additions to outfit		649.00		179.07
Ordinary repairs		442.97		200.83
Laundry, ice, miscellaneous expenses		1,529.24		256.92
Total		$18,461.55	$15,058.21	$15,855.78
Towboats and launches.				
Pay rolls			2,420.00	2,568.83
Coal for boiler			2,386.00	1,221.84
Coal for galley			34.00	
Supplies, subsistence				617.46
Supplies, engine room				30.00
Launch supplies				50.00
Renewals of or additions to outfit				107.00
Ordinary repairs				40.08
Laundry, ice, miscellaneous expenses, etc				349.13
Total			$4,840	$4,984.34
Barges.				
Ordinary repairs to barges				$452.15
Total field cost			$19,898.21	$21,292.27
Total field cost per cubic yard			$0.063	$0.067
Office expenses, superintendence, surveys, etc		$506.50	$4,183.53	1,190.09
Extraordinary repairs to dredge		4,251.10	[1] 1,540.82	
Extraordinary repairs to towboats and launches				
Extraordinary repairs to barges			5,775.37	
Total			$31,397.93	$22,482.36

Miscellaneous.				
Gross cost per cubic yard			$0.099	$0.071.
Fuel consumed by dredge		2,626.42 barrels fuel oil, 377 barrels coal.	320 barrels coal in 24 hours	1.074 tons.
Fuel consumed by auxiliary plant				400 tons.
Cost of fuel		Oil, $1.0038 per barrel; oil, coal, $0.0234 per barrel.		$2.34 to $3.15 per ton.
Water purchased				
Cost of water				

Remarks.

Flat Lake, La.: Dredging from Drew's Pass to the first light in lake. Depth before dredging, 8½ feet; depth after dredging, 10 feet. Material, mud and few shells.

Plaquemine Locks, La.: Dredging around lock gates. Depths not known. Black mud.

Bayou Teche, La.: Dredging shoal places from Hanson Canal, about 3 miles below Franklin, to Charenton, La., about 20 miles above Franklin. Depth before dredging, average 4 feet; depth after dredging, 8 feet. Material, very soft silt.

Calcasieu Lake, La.: Redredging channel along the jetty at the south side of the lake for a distance of about 7,000 feet. Depth before dredging, average about 4 feet; depth after dredging, 8 feet. Material, soft mud and shells.

Remarks.

Working at following places:

Locality.	Miles below Cairo.	Average depth.	
		Before dredging.	After dredging.
		Feet.	*Feet.*
Patton Crossing	241	7	11
Catfish Point	422	9	11½
Ashton	519	9	12.5
Youngs Point	557	9	12

NOTE.—The cost per cubic yard, based on total field cost or on gross cost, gives no idea of the efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.029.

Remarks.

Dredging operations were performed in Mississippi River at: Davenport, Iowa; Fairport, Iowa; Muscatine to New Boston, Keithsburg, Keokuk, and Quincy.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Flad, Henry.*	*Florida.*	*Fort Chartres.*	*Fort Gage.*
When built	1901	1904-5	1907-8	1907-8.
Where built	Grafton, Ill	Jacksonville, Fla	Dubuque, Iowa	Dubuque, Iowa.
Builder	Bucyrus Steam Shovel & Dredge Co.	Merril-Stevens Co	Dubuque Boat & Boiler Works, Dubuque, Iowa.	Dubuque Boat & Boiler Works, Dubuque, Iowa.
Time to build	About 25 months	8 months	19 months	16 months.
Material of hull	Steel	Steel	Steel	Steel.
Contract cost	$122,400, with pipe line and outfit $135,400.	$80,000		
Cost of outfit	$3,000	$10,000	$176,795.56	$177,978.98.
Length	192 feet	152 feet over all except over hang of wheel.	197 feet	197 feet.
Beam	44 feet	29 feet 9 inches	45 feet	45 feet.
Depth	7 feet	7 feet	7 feet	7 feet 6 inches.
Number, size, and type of propelling engines.	Two—22-inch cylinders, 7-foot stroke, Mississippi River side wheel.	Two—15.5-inch by 5-foot 6-inch horizontal Marshall valve gear.	Two—24-inch by 8-foot stroke, Mississippi River type.	Two—24-inch by 8-foot stroke, Mississippi River type.
Number, size, and type of pumping engines.	Two—15 and 30 by 24 inch horizontal tandem compound, condensing.	One 12 and 20 by 12 inch Westinghouse automatic.	Two—16½ and 30 by 24 inch tandem compound, condensing.	Two—16½ and 30 by 24 inch tandem compound, condensing.
Boilers:				
Number and type	7 Mississippi River	2 Clyde	6 Mississippi River type	6 Mississippi River type.
Length	30 feet	11 feet 3 inches	30 feet	30 feet.
Diameter	44 inches	8 feet	44 inches, 5 flues; three 10-inch; two 11-inch.	44 inches, 5 flues; three 10-inch; two 11-inch.
Heating surface (total)	3,830 square feet	1,087 square feet each, both boilers 2,174 square feet.	3,925 square feet	3,925 square feet.
Grate surface (total)	157.5 square feet	27 square feet each, both boilers 54 square feet.	131 square feet	131 square feet.
WORK PERFORMED.				
District to which dredge belongs	Mississippi River Commission	Jacksonville, Fla	St. Louis, Mo	St. Louis, Mo.
Location of dredging	Mississippi River, below Cairo. See remarks.	St. Johns River		
Depth before dredging, average	do	+3 to 8 feet	6½ feet	6¾ feet.
Depth after dredging, average	do	9 to 17 feet	11 feet	9 feet.
Character of material dredged	Sand, gravel, and drift	Sand, mud, clay	Sand and gravel	Sand and gravel.
Rate of advance per hour	132 feet	23.6 feet	130 feet	120 feet.
Amount dredged during year	230,910 cubic yards	633,131.4 cubic yards	900,250 cubic yards	801,350 cubic yards.
Average amount dredged:				
Per hour	652 cubic yards	222.4 cubic yards	1,200 cubic yards	1,000 cubic yards.
Per day		3,058.6 cubic yards (207 days)	10,000 cubic yards	10,000 cubic yards.

PLANT.				
Discharge pipe in use	800 feet	150 to 800 feet	440 feet	440 feet.
Diameter of discharge pipe	32 inches	12 inches	32 inches	32 inches.
Number of pontoons in use	8	5 to 25	9	9.
Revolutions per minute:				
Propelling engines	25	17	15	15.
Pumping engines	129	270	144	144.
Type of agitator or cutter head	Water-jet agitator	Suction head with fixed teeth	Water-jet sand agitator	Water-jet sand agitator.
Type of suction head	Upstream with water jets		Dustpan	Dustpan.
Revolutions per minute of cutter head		None		
Average boiler pressure (gauge)	131 pounds	115 pounds	100 pounds (allowed)	160 pounds (163 allowed).
Kind of coal used	Pittsburgh bituminous	Bituminous	Standard Illinois bituminous, mine run.	Standard Illinois bituminous, mine run.
Average vacuum in suction pipe	12 inches	14 inches	19 inches	19 inches.
Average gauge pressure in discharge pipe	10 pounds	7 pounds	5 pounds	5 pounds.
Draft of dredge:				
Forward	3 feet 10½ inches 15 feet from bow	4 feet 6 inches	4 feet	4 feet.
Aft	5 feet 27 feet from stern	4 feet 9 inches	do	Do.
Displacement of dredge	834 tons		815 tons (2,240 pounds), 29,800 cubic feet.	815 tons (2,240 pounds), 29,800 cubic feet.
Number of crew	43	21	52	52.
TOWBOATS.				
Name of tug attached to dredge			Aux Vasses (stern-wheel steam tender; no quarters).	Isle de Bois (stern-wheel steam tender; no quarters).
Number of crew			5 (included in dredge crew)	5 (included in dredge crew).
Displacement			50 tons (2,240 pounds)	50 tons (2,240 pounds).
Draft:				
Forward			27 inches	27 inches.
Aft			do	Do.
LAUNCHES.				
Name		Lunette	None attached	None attached.
Length		20 feet		
Beam		5 feet 6 inches		
Depth		3 feet 6 inches		
Draft		2 feet 6 inches		
Displacement		3 tons		
BARGES.				
Number of barges in use	1	None, except owned and used by contractor for coal delivery.	2	2.
Usage	Fuel		Fuel	Fuel.
Displacement, light			125 tons (2,240 pounds)	125 tons (2,240 pounds).
Capacity of all barges	600 tons		300 tons each (2,240 pounds)	300 tons each (2,240 pounds).

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Flad, Henry.*	*Florida.*	*Fort Chartres.*	*Fort Gage.*
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	354 hours	2,847 hours	805 hours	704 hours.
Handling pipe line		48 hours		
Handling swinging wires		3 hours		
Going to and from wharf and anchorage				
Placing dredge	34 hours	27 hours		
Waiting for vessels to pass	31 hours	4 hours		
DISTRIBUTION OF TIME LOST.				
Changing location of plant		96 hours	3,179 hours (not pumping)	3,206 hours (not pumping).
Bad weather		34 hours		
Washing boilers and ordinary repairs	76 hours	72 hours		
Extraordinary repairs		316 hours		
Other causes	16 hours	65 hours		
Sundays and holidays		760 hours		
Clearing right of way and blasting		216 hours		
COST OF WORK.				
Dredge.				
Pay rolls	$9,570.10	$15,054.86	$12,452.07	$12,505.60
Coal for boilers	3,841.48	6,665.28	8,476.07	7,235.55
Coal for galley	52.00		85.75	83.70
Water				
Dynamite		5,092.71		
Supplies, subsistence		5,653.49	4,054.31	3,989.20
Supplies, engine room		1,057.62	931.23	766.92
Other supplies		2,336.49		
Renewals of or additions to outfit		1,862.52		
Ordinary repairs		5,849.73	10,657.37	4,125.15
Laundry, ice, miscellaneous expenses, etc.		504.96	223.02	200.09
Total		$44,077.66	$36,879.82	$28,906.21
Towboats and launches.				
Pay rolls		(1)	1,670.00	1,680.00
Coal for boiler			[1] 857.54	[1] 837.00
Coal for galley				
Supplies, subsistence				
Supplies, engine room				
Launch supplies				
Renewals of or additions to outfit				
Ordinary repairs		545.77		
Laundry, ice, miscellaneous expenses, etc.				
Total			464.26	453.14

Barges.				
Ordinary repairs to barges			400.80	891.20
Total field cost	$16,904.15	$44,623.43	$40,272.42	$32,219.55
Total field cost per cubic yard	$0.0732	$0.074	$0.04¼	$0.04.
Office expenses, superintendence, surveys, etc.	[2] $4,183.53	$2,032.54	1,904.86	1,904.86
Extraordinary repairs to dredge	[2] 5,329.02	5,470.67		
Extraordinary repairs to towboats and launches.	[2] 1,098.94			
Extraordinary repairs to barges				
Total	$27,515.64	$52,126.64	[2] $42,177.28	[2] $34,124.41
MISCELLANEOUS.				
Gross cost per cubic yard	$0.1192	$0.0823	$0.07¼	$0.07¼.
Fuel consumed by dredge	400 barrels in 24 hours	1,259.4 tons	3,675.3 tons (of 2,000 pounds)	3,088.1 tons (of 2,000 pounds).
Fuel consumed by auxiliary plant			355.4 tons (of 2,000 pounds)	358.6 tons (of 2,000 pounds).
Cost of fuel		$5.292 per ton	$2.57 per ton (of 2,000 pounds)	$2.57 per ton (of 2,000 pounds).
Water purchased				
Cost of water				

Remarks.

Working at the following places in 1910:

Locality.	Miles below Cairo.	Average depth.	
		Before dredging.	After dredging.
		Feet.	*Feet.*
Fritz Crossing	101	10	14
Chute Island 30 Crossing	158	8½	11½
Island 35 Crossing	194	9	12

NOTE.—The cost per cubic yard based on total field cost, or on gross cost, gives no idea of the

Remarks.

From July 1 to 10, this dredge was making the voyage from Fort Myers to Jacksonville, Fla., at which place it arrived on July 10, 1910, and immediately underwent repairs which were completed on Aug. 16 and the dredge proceeded to Racy Point on the St. Johns River and began the work of dredging on Aug. 26. Removed to Orange Mills Flats on Sept. 27 and began dredging the same day and finished on Jan. 12, 1911. On Jan. 13, 1911, the dredge left for Jacksonville for extraordinary repairs to boiler, etc., which were completed on Jan. 26, after which the dredge proceeded up the St. Johns River and began work at Volusia bar on Feb. 2, where dredging was in operation until Mar. 6, 1911. The dredge arrived at Revolving Bend on Mar. 7 and began clearing right of way; dredging began Mar. 12,

Remarks.

Localities dredged and work done at each:

	Cubic yards.
Illinois Incline (Illinois Southern Ry.)	141,400
Stanton	38,150
Liberty Island	19,650
Seventy-six	39,050
Grand Tower	45,150
Crawford	98,500
Neelys	280,350
Price Towhead	102,600
Dogtooth	62,800
Thompson	87,100
Beechridge	45,500
Total	960,250

[1] 8,350 bushels.

[2] In addition to the above amount of $42,177.28, the sum of $17,176.98 for proportionate charges of engineer office general expense and care and use of plant, engineer depot, towboats, etc., and $9,888.38 for deterioration, is properly charge-

Remarks.

Localities dredged and work done at each:

	Cubic yards.
Whitehouse	14,900
Danby	17,300
Illinois Incline (Illinois Southern Ry.)	125,350
Crawford	24,800
Bennett	29,650
Neelys	250,200
Schenimann	69,750
Giboney Island	29,400
Dogtooth	140,200
Thompson	99,800
Total	801,350

[1] 8,150 bushels.

[2] In addition to the above amount of $34,124.41, the sum of $14,534.36 for proportionate charges of engineer office general expense and care and use of plant, engineer depot, towboats, etc., and $9,929.72 for deterioration, is properly chargeable to operation and care of the dredge, and is

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Flad, Henry.*	*Florida.*	*Fort Chartres.*	*Fort Gage.*
	Remarks—Continued. efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.022. [1] Upper works burned Jan. 11, 1908; rebuilt at West Memphis, Ark., February, 1908, to June, 1909. [2] Includes all repairs made when not in the field.	*Remarks*—Continued. and completed cut-off at this locality Mar. 28. Mar. 29 the dredge proceeded to Dutchmans Point, and began clearing right of way for cut-off and began dredging Apr. 7. This cut-off was completed on June 19. The dredge was moved to Florida Bend on the same date and the work of clearing right of way for cut-off was begun. Dredging at this locality was begun on June 29 and continued to end of fiscal year. NOTE.—From the beginning of work to Dec. 31, 1910, the dredge was worked with double crew and 20 hours' work daily was required. From Jan. 1, 1911, to end of fiscal year 10 hours' work daily was required with corresponding reduction in crew. [1] 1 man included in crew of dredge (rowboat).	*Remarks*—Continued. able to operation and care of the dredge, and is included in the gross cost of output per cubic yard.	*Remarks*—Continued. included in the gross cost of output per cubic yard.

Name	*Gamma.*	*Geyser.*	*Harrod, R. M.*	*Hecla.*
When built	1897	1893	1907	1900–1901.
Where built	Jeffersonville, Ind	Des Moines Rapids Canal	Grafton, Ill	Fountain City, Wis.
Builder	Bucyrus Steam Shovel & Dredge Co.	United States	The Springfield Boiler & Manufacturing Co.	United States.
Time to build	About 1 year	About 6 months	27 months	About 1 year.
Material of hull	Steel	Wood	Iron and steel	Fir and oak.
Contract cost	$85,530.60	$4,704[1]	$238,998.17	$27,064.[1]
Cost of outfit	$3,000 (approximate)		$3,000	
Length	138 feet	100 feet	210 feet	120 feet.
Beam	38 feet	20 feet	44 feet	26 feet.
Depth	7 feet 10 inches	4 feet	8 feet 6 inches	5 feet.
Number, size, and type of propelling engines.	None	None	Two 20–40 by 30 inch cross compound condensing, geared to paddle wheels.	None.
Number, size, and type of pumping engines.	One 18 and 32½ by 22 inch horizontal cross compound condensing.	Simple horizontal, 1-cylinder 13 by 14 inches.	Two 20–34 by 24 inch horizontal tandem compound condensing.	Joseph Edwards centrifugal sand pump, engines 14 and 24 inches diameter, 15-inch stroke.
Boilers:				
Number and type	6 Mississippi River	1 horizontal, with ten 6-inch flues.	9 Mississippi River	Two, with fifty-eight 3½-inch tubes.
Length	28 feet	26 feet	28 feet	15 feet 6 inches.
Diameter	48 inches	42 inches	47 inches	84 inches.
Heating surface (total)	2,572 square feet	493 $\frac{24}{100}$ square feet	4,515 square feet	1,386 square feet.
Grate surface (total)	123½ square feet	14 square feet	205 square feet	49 square feet.
WORK PERFORMED.				
District to which dredge belongs	Mississippi River Commission	Rock Island, Ill	Mississippi River Commission	Rock Island, Ill.
Location of dredging	Mississippi River, below Cairo		Mississippi River, below Cairo	See Remarks.
Depth before dredging (average)	See Remarks	2 feet below low water	See Remarks	4 feet below low water.
Depth after dredging (average)	do	7 feet below low water	do	6 feet below low water.
Character of material dredged	Sand, blue mud, and gravel	Sand, mud, clay, and gravel	Sand, gravel, and blue mud	Sand, mud, and gravel.
Rate of advance per hour	169 feet	5.39 feet	226	22 feet.
Amount dredged during year	264,593 cubic yards	296,095 cubic yards	841,133 cubic yards	234,860 cubic yards.
Average amount dredged:				
Per hour	619 cubic yards	100 to 125 cubic yards	1,560 cubic yards	137.6 cubic yards (by soundings).
Per day		1,400 to 2,100 cubic yards		1,670 cubic yards (by soundings).
PLANT.				
Discharge pipe in use	360 feet	340 feet	400 feet	400 feet.
Diameter of discharge pipe	24 inches (originally 34 inches)	12 inches	36 inches	18 inches.
Number of pontons in use	6	10	8	8.
Revolutions per minute:				
Propelling engines		None	78, paddle wheels 16	None.
Pumping engines	150	135 to 140	140	185.
Type of agitator or cutter head	Water jet	None	Water jet	
Type of suction head	Upstream with water jets	Open 24 by 24 inches by 4 feet tapering to 12-inch pipe.	Up and down stream with water jets.	Plain square.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Gamma.*	*Geyser.*	*Harrod, B. M.*	*Hecla.*
PLANT—continued.				
Revolutions per minute of cutter head		No cutter head		
Average boiler pressure (gauge)	135 pounds	120 pounds	138 pounds	125 pounds.
Kind of coal used	Pittsburgh bituminous	Bituminous	Pittsburgh bituminous	Bituminous.
Average vacuum in suction pipe		13 inches	14 inches	16 to 18 inches.
Average gauge pressure in discharge pipe		12 pounds	12 pounds	8 to 10 pounds.
Draft of dredge:				
Forward	3 feet 8½ inches 5½ feet from bow	2 feet	6 feet 2½ inches 29 feet from bow	2.5 feet.
Aft	4 feet 8 inches 4 feet from transom	do	6 feet 6 inches 34 feet from stern	Do.
Displacement of dredge	581 tons (of 2,240 pounds)	100 long tons	1,270 tons	183 tons.
Number of crew		15	47	15 (2 crews) 10 hours each.
TOWBOATS.				
Name of tug attached to dredge	Nokomis	None		No boat attached to dredge; moved by Coal Bluff, Grace, or Lucia, as occasion demands.
Number of crew	12			
Displacement in tons	560			
Draft:				
Forward	4 feet			
Aft	4 feet 7 inches			
LAUNCHES.				
Name		Lark (motor skiff)		No launch attached to dredge.
Length		25 feet		
Beam		5 feet		
Depth		20 inches		
Draft		18 inches		
Displacement		¾ ton		
BARGES.				
Number of barges in use	1	2	1	2.
Usage	Coal	Fuel barges	Fuel	Used for coal.
Displacement, light	78 tons	22.2 long tons		40 tons.
Capacity of all barges	600 tons	50 tons each; total, 100 tons		135 tons each.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	427 hours 46 minutes	2,675.75 hours	539 hours	1,804 hours.
Handling pipe line		237 hours		164 hours.
Handling swinging wires		No record		66 hours.
Going to and from wharf and anchorage		None		

Placing dredge	36 hours 38 minutes	87.25 hours	44 hours	112¾ hours.
Waiting for vessels to pass	5 hours	17 hours	2 hours	115 hours.
DISTRIBUTION OF TIME LOST.				
Changing location of plant		59.5 hours		151 hours.
Bad weather		1.5 hours	23 hours	1 hour.
Washing boilers and ordinary repairs	49 hours	192.5 hours (boilers washed Sundays, also all slight repairs).	51 hours	69 hours.
Extraordinary repairs	359 hours	59.75 hours	None	246 hours.
Other causes	79 hours 35 minutes	57.5 hours	61 hours 20 minutes	335 hours.
Sundays and holidays		38 days		776 hours.
COST OF WORK.				
Dredge.				
Pay rolls	$7,068.21	$5,528.25	$10,996.57	
Coal for boilers	7,018.21	2,871.59	6,613.13	
Coal for galley	50.00	None	55.00	
Water		None		
Supplies, subsistence		1,390.41		
Supplies, engine room		111.01		
Other supplies		126.13		
Renewals or additions to outfit		235.41		
Ordinary repairs		662.56		
Laundry, ice, miscellaneous expenses		46.53		
Total	$14,136.42	$10,971.89	$17,664.70	
TOWBOATS AND LAUNCHES.				
Pay rolls	1,512.00	[2] 500.00		
Coal for boiler	1,487.00			
Coal for galley	25.00			
Supplies, subsistence				
Supplies, engine room				
Launch supplies		138.48		
Renewals of or additions to outfit		2.14		
Ordinary repairs		59.79		
Laundry, ice, miscellaneous expenses, etc				
Total	$3,024.00	$701.41		
Barges.				
Ordinary repairs to barges				
Total field cost	$17,160.42	$11,673.30	$21,333.61	
Total field cost per cubic yard	$0.0658	$0.039	$0.0732	$0.068.
Office expenses, superintendence, surveys, etc.	$4,183.53	$1,160.00	$4,183.53	
Extraordinary repairs to dredge	[1] 15,001.88		[1] 5,329.02	

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

<table>
<tr><th>Name</th><th><i>Gamma.</i></th><th><i>Geyser.</i></th><th><i>Harrod, B. M.</i></th><th><i>Hecla.</i></th></tr>
<tr><td>TOWBOATS AND LAUNCHES—continued.</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Extraordinary repairs to towboats and launches.</td><td>[2] $4,199.44</td><td></td><td>[1] $1,098.94</td><td></td></tr>
<tr><td>Extraordinary repairs to barges</td><td></td><td></td><td></td><td>[2] $1,254.51</td></tr>
<tr><td>Total</td><td>$40,635.27</td><td>$12,833.30</td><td>$27,515.64</td><td>$17,484.12</td></tr>
<tr><td><i>Miscellaneous.</i></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Gross cost per cubic yard</td><td>$0.1545</td><td>$0.043</td><td>$0.1192</td><td>$0.0744.</td></tr>
<tr><td>Fuel consumed by dredge</td><td>250 pounds coal in 24 hours</td><td>1,225 tons</td><td>600 barrels in 24 hours</td><td>1,566 tons.</td></tr>
<tr><td>Fuel consumed by auxiliary plant</td><td>350 pounds coal in 24 hours</td><td>158 gallons gasoline (launch)</td><td></td><td>98 tons.</td></tr>
<tr><td>Cost of fuel</td><td></td><td>$1.90 to $2.69 per gallon</td><td></td><td>$2.23 to $2.29 per ton</td></tr>
<tr><td>Water purchased</td><td></td><td></td><td></td><td></td></tr>
<tr><td>Cost of water</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td>
<td><i>Remarks.</i>
Working at following places in 1910:
<table>
<tr><th rowspan="2">Locality.</th><th rowspan="2">Miles below Cairo.</th><th colspan="2">Average depth.</th></tr>
<tr><th>Before dredging.</th><th>After dredging.</th></tr>
<tr><td></td><td></td><td><i>Feet.</i></td><td><i>Feet.</i></td></tr>
<tr><td>Fritz</td><td>101</td><td>11.0</td><td></td></tr>
<tr><td>Bullerton</td><td>167</td><td>9.0</td><td>10.0</td></tr>
<tr><td>Island 35</td><td>194</td><td>9.0</td><td>11.0</td></tr>
<tr><td>Walts</td><td>201</td><td>8.5</td><td>12.5</td></tr>
<tr><td>West Memphis (testing new suction head)</td><td>232</td><td></td><td></td></tr>
</table></td>
<td><i>Remarks.</i>
Mississippi River from Wisconsin River to Le Claire, as follows: Mile 262, vicinity of Eagle Point, Dubuque; mile 278, Harris Slough, Galena; miles 272–273, Nine Mile Island; miles 229–230, Guttenberg, Iowa, and Rock River Pool.
[1] Includes cost of Geyser outfit and 8 pontoons.
[2] No towboat attached to Geyser here.</td>
<td><i>Remarks.</i>
Working at the following places in 1910:
<table>
<tr><th rowspan="2">Locality.</th><th rowspan="2">Miles below Cairo.</th><th colspan="2">Average depth.</th></tr>
<tr><th>Before dredging.</th><th>After dredging.</th></tr>
<tr><td></td><td></td><td><i>Feet.</i></td><td><i>Feet.</i></td></tr>
<tr><td>Medleys</td><td>31</td><td>8</td><td>13</td></tr>
<tr><td>Upper Point Pleasant.</td><td>80</td><td>9</td><td>15</td></tr>
<tr><td>Lower Point Pleasant</td><td>81</td><td>9</td><td>13</td></tr>
<tr><td>Island No. 14</td><td>99</td><td>14</td><td>11</td></tr>
</table></td>
<td><i>Remarks.</i>
No towboat or launch with the dredge regularly. Dredging done as follows: In Des Moines Rapids Canal, Mundys Landing, mile 557; Mosier Island, mile 590; Stag Island, mile 603; Pharrs Island, mile 573; and Masons Island, mile 633.
[1] Includes contract price and cost of outfit.
[2] Building 10 new pontoons.</td></tr>
</table>

NOTE.—The cost per cubic yard based on total field cost, or on gross cost, gives no idea of the efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.026.

[1] Includes all repairs and betterments made when not in field.

[2] Includes all repairs made when not in field.

NOTE.—The cost per cubic yard based on total field cost, or on gross cost, gives no idea of the efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.010.

[1] Includes all repairs when not in the field.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Howell, Capt. C. W.*	*Humphreys, Chas.*	*Indiana.*	*Iota.*
When built	1904	1907–8	1908	1900.
Where built	Texas City, Tex	Mobile, Ala	Hull, Jeffersonville, Ind.; machinery, Baltimore, Md.	Grafton, Ill.
Builder	U. S. Engineer Department	United States	Hull, Howard Ship Yards Co.; machinery, Ellicott Machine Works.	Springfield Boiler & Manufacturing Co.
Time to build	6½ months	About 1 year	2½ years	About 2 years.
Material of hull	Wood	Wood	Steel	Steel.
Contract cost	$40,000 (includes cost of outfit as snag boat).	$46,560.97 [1]	(1)	$100,479.79.
Cost of outfit		Included in contract cost	$6,117.13	$3,000 (approximate).
Length	125 feet	100 feet	125 feet	192 feet.
Beam	26 feet	32 feet	34 feet	44 feet.
Depth	5 feet	8 feet 9 inches	6 feet 10 inches	7 feet.
Number, size, and type of propelling engines.	2; size, 12 by 48 inches	None	None	2, 22-inch cylinder, 6-foot stroke, Mississippi River, side wheel.
Number, size, and type of pumping engines.	1; 12 by 22 by 14 inches	1 vertical main compound engine, about 150 horsepower, direct connected to pump.	12 and 22 by 14 inches horizontal compound; develops 250 horsepower.	2, 16 and 26 by 20 inches, horizontal tandem compound, condensing.
Boilers:				
Number and type	2 Scotch marine	2 western river steamboat type, 5 flues (11-inch).	1 Worthington water tube, marine, 270 horsepower.	7 Mississippi River.
Length	10 feet	28 feet	10 feet 1 inch	30 feet.
Diameter	7 feet 6 inches	47 inches		44 inches.
Heating surface (total)	794 square feet	1,264.6 square feet	2,432 square feet	3,769 square feet.
Grate surface (total)	65 square feet	41.6 square feet	54.83 square feet	157.5 square feet.
WORK PERFORMED.				
District to which dredge belongs	Galveston	Mobile district	Cincinnati, Ohio, first	Mississippi River Commission.
Location of dredging	Galveston, Tex. (vicinity)	See remarks [1]	Lower Ohio River	Mississippi River below Cairo.
Depth before dredging, average	30 feet	5 feet	3 feet	See remarks.
Depth after dredging, average	5.5 feet	8.3 feet	8 feet	Do.
Character of material dredged	Sand, shell, mud, and clay	Sand and gravel	Sand, gravel, with some bowlders and loose rock.	Sand, gravel, lignite, and blue mud.
Rate of advance per hour	23 feet	7 feet	10 to 20 feet	146 feet.
Amount dredged during year	524,525 cubic yards	122,576 cubic yards	264,612 cubic yards	238,768 cubic yards.
Average amount dredged:				
Per hour	121.5 cubic yards	68.6 cubic yards	238 cubic yards	617 cubic yards.
Per day	2,293.33 cubic yards	945.6 cubic yards	2,380 cubic yards	

PLANT.				
Discharge pipe in use	225 feet	387 lineal feet (average)	From 250 to 600 feet	500 feet.
Diameter of discharge pipe	12 inches	12 inches	17 inches outside diameter	32 $\frac{11}{16}$ inches.
Number of pontoons in use	7	12	10 (60 feet to each pontoon)	10.
Revolutions per minute:				
Propelling engines	16	None	None	16.
Pumping engines	185	213 revolutions per minute	240	149.
Type of agitator or cutter head	Open cutter	Hemispherical, rotary	Steel, spiral, 5 feet diameter	Water-jet agitator.
Type of suction head	Open	Open flange (opening inside cutter head).	Elliptical opening 13 by 19 inches, suction pipe at cutter head.	Upstream with water jets.
Revolutions per minute of cutter head	35	8	15 to 20	
Average boiler pressure (gauge)	120 pounds	125 pounds	150 pounds	138 pounds.
Kind of fuel used	Fuel oil	Bituminous coal, run of mine	Bituminous coal, run of mine	Pittsburgh bituminous coal.
Average vacuum in suction pipe	15 inches	9 inches	12 to 18 inches	7 inches.
Average gauge pressure in discharge pipe	10 pounds	16 pounds	8 to 15 pounds	11 pounds.
Draft of dredge:				
Forward	3 feet 7½ inches	3 feet	3 feet 8 inches	3 feet 9 inches, 15 feet from bow.
Aft	3 feet 8 inches	2 feet 6 inches	do	4 feet 9 inches, 27 feet from stern.
Displacement of dredge	300 tons	234 tons	417.5 tons	800 tons.
Number of crew	35	20.41 (average)	28 (double crew)	43.
TOWBOATS.				
Name of tug attached to dredge	None		Hired dredge tender S. P. Gillett.	
Number of crew			9	
Displacement in tons			Not known	
Draft:				
Forward			36 inches	
Aft			do	
LAUNCHES.				
Name	(a) Bastrop, (b) Bar		Nell	
Length	(a) 46 feet 6 inches, (b) 27 feet		25 feet	
Beam	(a) 11 feet 3 inches, (b) 7 feet		5.5 feet	
Depth	(a) 5 feet, (b) 3 feet		2.25 feet	
Draft	(a) 3 feet 6 inches, (b) 2 feet 6 inches.		2 feet	
Displacement	(a) 16 tons, (b) 2 tons		1.5 tons	
BARGES.				
Number of barges in use	2	2	1 steel flat 24 by 110 by 5 feet	1.
Usage	Water and oil	Coaling dredge	To carry extra pipe line, supplies, etc.	Fuel.
Displacement, light	52.68 tons	57 tons each	63 tons	
Capacity of all barges	100 tons	400 tons	206 tons	600 tons.

	Capt. C. W.	Humphreys, Chas.	Indiana.	Iota.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	4,319 hours	1,508 hours 30 minutes	855 hours 15 minutes	387 hours.
Handling pipe line	192 hours 45 minutes	161 hours	89 hours 20 minutes	
Handling swinging wires	283 hours 5 minutes	111 hours	70 hours 20 minutes	
Going to and from wharf and anchorage				
Placing dredge		7 hours	65 hours 5 minutes	63 hours.
Waiting for vessels to pass			2 hours 45 minutes	5 hours.
Removing snags			7 hours 35 minutes	
DISTRIBUTION OF TIME LOST.				
Changing location of plant	574 hours 25 minutes	202 hours	144 hours 30 minutes	
Bad weather	213 hours 45 minutes	383 hours	7 hours 10 minutes	
Washing boilers and ordinary repairs	380 hours 40 minutes	166 hours 30 minutes	116 hours 5 minutes	126 hours.
Extraordinary repairs	462 hours	50 hours		29 hours.
High water			282 hours	
Other causes	546 hours	475 hours	94 hours 40 minutes	
Sundays and holidays	1,262 hours	816 hours	338 hours	
Taking fuel oil and water	22 hours 20 minutes			
Time lost while working with single crew	504 hours			
COST OF WORK.				
Dredge.				
Pay rolls	$21,424.99	$6,852.29	$10,776.11	$9,646.73
Fuel for boilers	16,561.17	1,555.25	1,101.22	4,727.72
Fuel for galley	182.50	7.50		52.00
Water	105.52			
Supplies, subsistence	6,190.79	1,246.12	2,376.59	
Supplies, engine room	1,781.68	242.97	316.16	
Other supplies	2,328.70	229.35		
Renewals or additions to outfit	2,534.36	2,348.30	2,525.79	
Ordinary repairs	752.70	2,193.83	1,736.70	
Laundry, ice, miscellaneous expenses	889.90	258.09	115.28	
Total	$52,752.31	[1]$14,933.70	$18,947.85	

Towboats and launches.				
Pay rolls			[2] 26,763.01	
Fuel for boilers				
Fuel for galley				
Supplies, subsistence				
Supplies, engine room				
Launch supplies				
Renewals of or additions to outfit				
Ordinary repairs				
Laundry, ice, miscellaneous expenses, etc.				
Total cost of launches	$2,204.69			
Barges.				
Ordinary repairs to barges	$129.05			
Miscellaneous expenses	12.00			
Total field cost	$55,224.53	$14,933.70	$26,763.01	$18,123.07
Total field cost per cubic yard	$0.09607	$0.12183	$0.101	$0.0759.
Office expenses, superintendence, surveys, etc.	$1,400.45	(3)		4,183.53
Extraordinary repairs to dredge	2,884.07			[1] 4,832.21
Extraordinary repairs to towboats and launches.	263.84			[1] 1,098.94
Extraordinary repairs to barges and pontoons.	79.24			
Total	$57,637.99	$14,933.70	$26,763.01	$28,237.75
Miscellaneous.				
Gross cost per cubic yard	$0.10439	$0.12183	$0.101	$0.1183.
Fuel consumed by dredge	14,060 barrels	1,250.2 tons	567.2 tons	400 lbs. coal in 24 hours.
Fuel consumed by auxiliary plant	No record		None	
Cost of fuel	119 per barrel	$1.25 per ton	$1.375 to $2.9375 per ton	
Water purchased	175,468 gallons		None	
Cost of water	$0.5008 per 1,000 gallons		do	

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Howell, Capt. C. W.*	*Humphreys, Chas.*	*Indiana.*	*Iota.*
	Remarks.	*Remarks.*	*Remarks.*	*Remarks.*
	Dredge worked at Double Bayou, Cedar Bayou, Clear Creek, Chocolate Bayou, Dickinson Bayou, Hannas Reef, Turtle Bayou, Oyster Creek, and channel from Aransas Pass to Pass Cavallo. Fort Point charges 126.48. Clear.	Location of dredging: *Cu. yds.* Bar above Tuscaloosa County bridge..... 4,448.0 Eagle Shoals... 5,628.0 Little Log Shoals........ 12,273.1 Kings Mountain bar........... 4,327.4 Guy Foster's bar........... 8,595.7 Mud bar....... 7,461.1 Lock chamber, Lock No. 9... 428.8 Lower approach Lock No. 9... 2,725.0 Dropout bar... 15,538.3 Battles Gin bar. 19,914.8 Washington bar No. 1......... 12,030.0 Washington bar No. 2......... 8,857.4 Kings bar...... 11,148.1 McGifferts bar (estimated).. 9,200.0 Total......... 122,575.7 NOTE.—All measurements in place. [1] This dredge operated between Lock No. 10 and McGifferts bar, Black Warrior River, Ala., dredging in channel between locks from July 1, 1910, to Jan. 10, 1911. [2] This total includes the cost of towing coal, subsistence supplies, etc., by United States towboats in this reach of river. [3] Expenses included in above.	[1] Hull and upper works $27,886.94; machinery, $59,925; pontoons and pipe line, $16,678.30; plumbing, heating, electric lighting, refrigerating plant, $4,722.95; steel flatboat, $7,425; total, $116,638.19. [2] Towboat tender hired at $53.45 per day, covering boat, crew, fuel, and all expenses, $6,990.16; additional towage, $825; total, 26,763.01.	Working at the following places in 1910: Locality. | Miles below Cairo. | Average depth: Before dredging. | After dredging. *Feet.* | *Feet.* Island 35 crossing . | 194 | 9½ | 12½ Walts crossing . | 201 | 9 | 10 Daisy crossing . | 252 | 8½ | 11 NOTE.—The cost per cubic yard based on total field cost, or on gross cost, gives no idea of the efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.027. [1] Includes all repairs made when not in the field.

Name	*Jacksonville.*	*Kappa.*	*Ludlow, Genl.*	*Miller, Col. A. M.*
When built	1903–4	1901	1904	1906.
Where built	Jacksonville, Fla	Grafton, Ill	Grand Haven, Mich	Galveston, Tex.
Builder	United States	Bucyrus Steam Shovel & Dredge Co.	United States	Bowers Southern Dredging Co.
Time to build	About 1 year	About 25 months	Not known	July 28, 1905–Jan. 11, 1906.
Material of hull	Wood	Steel	Steel	Longleaf pine; copper sheathed.
Contract cost	$125,000	$122,400 (with pipe line and outfit, $135,400).	$49,300	$102,000.
Cost of outfit	Not known			$10,952.45.
Length	138 feet	192 feet	162 feet 1 inch	138 feet 6 inches.
Beam	40 feet	44 feet	36 feet 9 inches	37 feet.
Depth	9 feet 5 inches	7 feet	4 feet	13 feet.
Number, size, and type of propelling engines.	No propelling engines	Two, 22-inch cylinder, 7-foot stroke, Mississippi River side-wheel.	None	None.
Number, size, and type of pumping engines.	1 triple-expansion marine engine, 17 and 27½ and 42 by 20-inch stroke.	Two, 15 by 30 by 24 inch horizontal tandem compound condensing.	One 250-horsepower compound, direct connected to 20-inch centrifugal pump.	1 triple-expansion; size 14 and 22½ and 36 inch; 18-inch stroke.
Boilers:				
Number and type	4 Babcock & Wilcox Co. water-tube boilers.	7 Mississippi River	2 Scotch	2 Heine boilers.
Length	14 feet	30 feet	11 feet	16 feet.
Diameter	Two 11 feet high and 7½ feet wide; two 11 feet high and 8 feet wide.	44 inches	do	Tubes 15 feet ¾ inch by 3¼ inches; steam drums 18 feet long, 3 feet diameter.
Heating surface (total)	5,411 square feet	3,830 square feet	Not known	4,270 square feet.
Grate surface (total)	157 square feet	157.5 square feet	do	108 square feet.
WORK PERFORMED.				
District to which dredge belongs	Jacksonville, Fla.; rented to Wilmington, N. C.	Mississippi River Commission	Grand Rapids, Mich	Galveston, Tex.
Location of dredging	Channels in Cape Fear River, N. C., between Wilmington and Big Island, 7 miles below.	Mississippi River, below Cairo	No dredging done during year	Do.
Depth before dredging, average	River channels, 24 feet; anchorage basin, 10 feet to 16 feet.	See remarks		24 feet.
Depth after dredging, average	River channels, 29 feet; anchorage basin, 25 feet.	do		35 feet.
Character of material dredged	Sand, mud, clay, and silt	Sand, mud, gravel, and drift		Mud, sand, and hard red clay.
Rate of advance per hour	10 feet	126 feet		4.56 feet.
Amount dredged during year	688,558 cubic yards	519,019 cubic yards		1,333,927 cubic yards.
Amount rehandled during year	431,121 cubic yards			
Average amount dredged:				
Per hour	260 cubic yards; 163 cubic yards rehandled.	564 cubic yards		296.20 cubic yards (pumping).
Per day	2,541 cubic yards; 1,591 cubic yards rehandled.			4,373 cubic yards (when dredging was done).

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Jacksonville.*	*Kappa.*	*Ludlow, Genl.*	*Miller, Col. A. M.*
PLANT.				
Discharge pipe in use	1,000 feet	500 feet		1,600 feet.
Diameter of discharge pipe	32 inches	31⅞ inches	20 inches	20 inches.
Number of pontons in use	6 per 100 feet	8	None	30.
Revolutions per minute:				
Propelling engines	No propeller	17		None.
Pumping engines	160	127		180.
Type of agitator or cutter heads	No cutter	Water jet agitator		Open cutter.
Type of suction head	Jet agitator	Upstream with water jets		Open.
Revolutions per minute of cutter head	No cutter			10.
Average boiler pressure (gauge)	175 pounds	139 pounds		185 pounds.
Kind of fuel used	Bituminous coal	Pittsburgh bituminous coal		Crude oil.
Average vacuum in suction pipe	15 inches	12 inches		15 inches.
Average gauge pressure in discharge pipe	15 pounds	10 pounds		20 pounds.
Draft of dredge:				
Forward	6 feet	3 feet 10¼ inches 15 feet from bow	32 inches	8 feet.
Aft	7 feet	5 feet, 27 inches from stern		7.6 feet.
Displacement of dredge	900 tons	834 tons	190 tons	710 tons.
Number of crew	30	43		47 to 54 men; varies according to work on dike, etc.
TOWBOATS.				
Name of tug attached to dredge	(1)			Capt. R. B. Talfor.
Number of crew				7.
Displacement in tons				43 tons.
Draft:				
Forward				4 feet 6 inches.
Aft				7 feet.
LAUNCHES.				
Name				C. B. C.
Length				20 feet 4 inches.
Beam				6 feet.
Depth				3 feet.
Draft				32 inches.
Displacement				1 ton.

BARGES.				
Number of barges in use	1	1		1.
Usage	Coal	Fuel		Carrying oil and water.
Displacement, light	10 tons			60 tons.
Capacity of all barges	100 tons	600 tons		285, loaded.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	2,650 hours 47 minutes	920 hours		4,508 hours 25 minutes.
Handling pipe line	373 hours 19 minutes			169 hours 45 minutes.
Handling swinging wires	138 hours 26 minutes			94 hours 25 minutes.
Going to and from wharf and anchorage				
Placing dredge	14 hours 15 minutes	32 hours		
Waiting for vessels to pass		17 hours		
DISTRIBUTION OF TIME LOST.				
Changing location of plant	164 hours 57 minutes			122 hours 30 minutes.
Bad weather				110 hours 25 minutes.
Washing boilers and ordinary repairs	588 hours 13 minutes	201 hours		677 hours 50 minutes.
Extraordinary repairs		53 hours		1,477 hours 25 minutes.
Other causes	364 hours 3 minutes	59 hours		428 hours 15 minutes.
Sundays, holidays, and half holidays	65½ days			1,176 hours.
COST OF WORK.				
Dredge.				
Pay rolls	$20,101.68	$9,931.33		$24,715.81
Fuel for boilers	15,391.14	6,577.58		27,408.00
Rubber sleeves	3,934.00	52.00		253.30
Rent of dredge	14,965.00			307.12
Supplies, subsistence	5,584.53			7,081.89
Supplies, engine room	1,826.36			2,382.32
Other supplies (principally rope)	2,578.56			3,759.98
Renewals or additions to outfit				7,649.53
Ordinary repairs to dredge, pontoons, and pipe line.	6,417.54			658.01
Fort Point depot expenses				582.45
Laundry, ice, etc	365.53			5,726.39
Total	$71,164.34			$80,524.80

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Jacksonville.*	*Kappa.*	*Ludlow, Genl.*	*Miller, Col. A. M.*
COST OF WORK—continued.				
Towboats and launches.				
Pay rolls	$1,355.00			$2,405.13
Coal for boiler				1,371.71
Coal for galley				41.20
Water				14.88
Supplies, subsistence				921.15
Supplies, engine room				222.63
Launch supplies				358.22
Renewals of or additions to outfit				90.44
Ordinary repairs				28.70
Laundry, ice, miscellaneous expenses, etc.				103.49
Total	$1,355.00			$5,557.55
Barges.				
Ordinary repairs to barges	$50.30			359.95
Miscellaneous expenses				12.60
Total field cost	[3] $72,569.64	$20,474.31		$86,455.09
Total field cost per cubic yard	$0.077	$0.0394		$0.06456.
Total field cost per cubic yard rehandled	$0.04			
Office expenses, superintendence, surveys, etc.	7,164.00	4,183.53		6,408.35
Extraordinary repairs to dredge		[1] 3,658.34		16,081.18
Extraordinary repairs to towboats and launches.		[1] 1,098.94		4,017.48
Extraordinary repairs to barges				3,724.16
Total	[3] $79,733.64	$29,415.12		$116,686.26
Miscellaneous.				
Gross cost per cubic yard dredged	$0.087+	$0.0567		$0.08745.
Gross cost per cubic yard rehandled	$0.04			
Fuel consumed by dredge	4,569.5 short tons	400 bbls. coal in 24 hours		24,923 barrels.
Fuel consumed by auxiliary plant	About 100 tons			1,259.5 barrels.
Cost of fuel	$3.37 per ton			$1.10, $0.96, and $1 per barrel.
Water purchased				3,393,151 gallons.
Cost of water				$0.0905 per 1,000 gallons.

Remarks.

Dredge operated day and night during October, November, and December. During balance of time it was operated during the day only.

[1] Dredge does not require the constant use of a tug, and tugs doing other work waited on her from time to time, and the proper part of the cost of their operations are charged to the cost of this work.

Several tugs spent a small portion of their time waiting on this dredge, therefore the proportional part of the cost of their operations during this time can not very well be given in detail.

[3] This dredge spent 16 days making a fill at the repair yard, at a cost of $2,500; therefore this amount was deducted from the field cost, $72,569 64, and from the total cost, $79,733.64, before obtaining the field and total cost per cubic yard.

Remarks.

Working at following places in 1910:

Locality.	Miles below Cairo.	Average depth—	
		Before dredging.	After dredging.
		Feet.	*Feet.*
Head Island 30 crossing	158	8	13½
Gold Dust crossing	158	9	15
New Haven crossing	163	6	11½

Note.—The cost per cubic yard based on total field cost or on gross cost gives no idea of the efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.020.

[1] **Includes all repairs made when not in the field.**

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Morgan.*	*Muscogee* (formerly dredge No. 4).	*Oregon* (Coos Bay).	*Oregon* (Grays Harbor).
When built	1907-8	1904	1908	
Where built	Baltimore, Md	Bainbridge, Ga	Portland, Oreg	
Builder	Ellicott Machine Co	M. A. Sweeney Shipyard & Foundry Co.	Portland Iron Works	
Time to build	About 7 months	7 months	8 months	
Material of hull	Steel	Yellow pine	Wood	
Contract cost	$119,676.21	$12,900	$79,340	
Cost of outfit	$31,500.13	Included in contract cost	$81,274	
Length	134 feet 5 inches	120 feet	120 feet	
Beam	38 feet	30 feet	36 feet	
Depth	8 feet	7.5 feet	11 feet	
Number, size, and type of propelling engines.	2—double horizontal, 12 by 14 inch stroke triple expansion.	None		
Number, size, and type of pumping engines.	One—12 and 20 and 32 inch cylinders, 20-inch stroke triple expansion.	One—12 and 20 by 12 inch stroke, Westinghouse compound.	1 ball engine, 18 and 28 inch diameter, 18-inch stroke.	
Boilers:				
Number and type	2 Scotch marine boilers	1 Scotch marine, water back	2 Heine pipe boilers	
Length	11 feet	17 feet 5 inches over all	18 feet	
Diameter	do	8 feet	14 feet	
Heating surface (total)	2,730 square feet	946 square feet	4,400 square feet	
Grate surface (total)	90 square feet	24 square feet	96 square feet	
Work performed.				
District to which dredge belongs	Savannah, Ga	Montgomery, Ala	First, Portland, Oreg	Seattle, Wash., and Portland, Oreg., July 1 to Oct. 6, 1910; Grays Harbor and Chehalis River, Wash.
Location of dredging	(a) Red Light dumping ground, (b) Mud River dumping ground, (c) quarantine.	Chattahoochee River, Ga. and Ala.; channel from Apalachicola River to St. Andrews Bay, Fla.	Coos Bay and Coquille River, Oreg.	
Depth before dredging, average	(a) 0 to 30 feet, (b) 13 to 22 feet, (c) 17 to 30 feet.	River work, 2 feet; channel from Apalachicola River to St. Andrews Bay, Fla., 2 feet.	13 feet	Grays Harbor, 14 feet; Chehalis River, 4½ feet.
Depth after dredging, average	(a) 22 to 31 feet, (b) 27 to 30 feet, (c) 25.3 to 31 feet.	River work, 4 feet; channel from Apalachicola River to St. Andrews Bay, Fla., 6 feet.	18 feet	Grays Harbor, 19 feet; Chehalis River, 7½ feet.
Character of material dredged	(a) Mud, clay, sand, shell; (b) clay, sand, shell; (c) mud, sand, shell, and parts of old wreckage.	River work, sand, gravel, and marl; channel from Apalachicola River to St. Andrews Bay, Fla., mud and shells.	Sand, shell, clay and mud	Mud, clay, sand, gravel, and cement gravel.
Rate of advance per hour	3.72 feet	8.2 feet (average)	18 feet	62 feet.
Amount dredged during year	1,113,535 cubic yards	104,440 cubic yards	446,654 cubic yards (8 months)	197,852 cubic yards.

Average amount dredged:				
Per hour	269.83 cubic yards	104 cubic yards	450 cubic yards	401 cubic yards.
Per day	4,504.98 cubic yards	764 cubic yards	3,200 cubic yards	3,311 cubic yards.
PLANT.				
Discharge pipe in use	700 feet on pontons and 700 to 800 feet ashore.	500 feet	650 feet	030 feet (average).
Diameter of discharge pipe	20 inches	12 inches	18 inches	18 inches.
Number of pontons in use	24 inches	20	12	21.
Revolutions per minute:				
Propelling engines	150	None	None	
Pumping engines	195	300	175	175.
Type of agitator or cutter head	Revolving, with 6 knives	Reversible drag	Revolving cutter	
Type of suction head	Suction pipe elongated	None	Ordinary suction pipe 18 inches diameter inside of revolving cutter.	
Revolutions per minute of cutter head	15 to 20	Drag cutter does not revolve	9	7.
Average boiler pressure (gauge)	190	150 pounds	135 pounds	135.
Kind of fuel used	Bituminous coal	Bituminous coal	Slab wood	Mill slab wood.
Average vacuum in suction pipe	16 to 18 inches	16 inches	19 inches	24 inches.
Average gauge pressure in discharge pipe	14 pounds	13 pounds	20 pounds	21 pounds.
Draft of dredge:				
Forward	5 feet 8 inches	3 feet	5 feet	5 feet.
Aft	5 feet	do	do	Do.
Displacement of dredge	757 tons	281 long tons	535 tons	535 tons.
Number of crew	43	10	24	22.
TOWBOATS.				
Name of tug attached to dredge	Gibbon	Towboat Columbus	Hired tug	
Number of crew	5	12	2	
Displacement in tons	124 tons	227.5 long tons	41	
Draft:				
Forward	5 feet 6 inches	2 feet	4 feet	
Aft	9 feet	3 feet	5 feet	
LAUNCHES.				
Name	None	Eufaula	1 hired part of time	Walter (hired).
Length		25 feet		45 feet.
Beam		7 feet 3 inches		11 feet 6 inches.
Depth		2 feet 4 inches		4 feet 6 inches.
Draft		14 inches		12½ tons.
Displacement		2 long tons		3 feet 6 inches.
BARGES.				
Number of barges in use	2	One 125 by 28 by 7 feet	1 to 3	1.
Usage	Coal and water derricks	For coaling dredge	Fuel, water, and repair scow	Wood and water.
Displacement, light	Coal lighter, 61 tons; derrick lighter, 42 tons.	87 long tons	120 tons	30 tons.
Capacity of all barges	(a) 196 tons, (b) 96 tons; total 292 tons.	358 long tons	300 tons	100 tons.

TABLE II.—*Report of operations of pipe-line hydrauilc dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Morgan.*	*Muscogee* (formerly dredge *No. 4*).	*Oregon.*	*Oregon.*
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	4,051 hours 41 minutes	1,004 hours	1,077 hours	442 hours 5 minutes.
Handling pipe line	402 hours 10 minutes	320 hours	275 hours	23 hours 25 minutes.
Handling swinging wires	161 hours 51 minutes	None	79 hours	24 hours 10 minutes.
Going to and from wharf and anchorage		56 hours		20 hours.
Placing dredge		72 hours	12 hours	8 hours 15 minutes.
Waiting for vessels to pass		52 hours	4 hours	1 hour 10 minutes.
DISTRIBUTION OF TIME LOST.				
Changing location of plant	309 hours 30 minutes	120 hours	107 hours	32 hours.
Bad weather	327 hours 20 minutes	do	68 hours	
Washing boilers and ordinary repairs	552 hours 45 minutes	184 hours	62 hours	1 hour 35 minutes.
Extraordinary repairs	488 hours 50 minutes	60 hours	145 hours	115 hours.
Other causes	530 hours 25 minutes	105 hours	120 hours	85 hours 52 minutes.
Sundays and holidays	1,392 hours	304 hours	380 hours	222 hours 30 minutes.
COST OF WORK.				
Dredge.				
Pay rolls	$24,636.99	$5,061.61	$11,806.00	$4,614.74
Coal for boilers	10,488.94	1,888.63	4,604.00	2,100.77
Coal for galley		52.50	50.00	
Water			72.00	8.96
Supplies, subsistence	7,092.89	2,486.94	2,799.00	898.26
Supplies, engine room	3,227.75	426.84	392.00	161.36
Other supplies	10,469.47	732.32	1,170.00	396.78
Renewals or additions to outfit	3,277.23	3,532.09	9,238.00	802.10
Ordinary repairs	2,862.53	414.67	329.00	477.52
Laundry, ice, miscellaneous expenses	994.04	395.03	135.00	97.18
Total	$63,049.84	$14,990.63	$30,545.00	$9,557.67
Towboats and launches.				
Pay rolls	3,179.17	2,289.29		
Coal for boilers	1,827.00	506.72		
Coal for galley		23.00		
Supplies, subsistence	1,142.77	318.34		
Supplies, engine room	2,367.94	163.88		
Launch supplies	283.69	171.47		
Renewals of or additions to outfit		12.00		
Ordinary repairs	752.99	487.98		

Laundry, ice, miscellaneous expenses, etc.	275.34		201.30					
Total		9,828.90		19,164.61		[1] 2,150.00		1,156.60
Barges.								
Ordinary repairs to barges	106.13				[2] 369.00			
Total field cost		72,984.87		19,164.61				10,714.27
Total field cost per cubic yard	$0.06554		$0.183				$0.054	
Office expenses, superintendence, surveys, etc.	6,722.53		356.64				1,209.37	
Extraordinary repairs to dredge	8,692.03		None				833.95	
Extraordinary repairs to tugboats and launches.	4,342.32							
Extraordinary repairs to barges								
Total		$82,741.75		$19,521.25		$33,064.00		$12,757.59
Miscellaneous.								
Gross cost per cubic yard	$0.07430		$0.187		$0.074		$0.0645.	
Fuel consumed by dredge	2,694.8 tons coal		878 short tons		1,988 cords of slab wood		853½ cords.	
Fuel consumed by auxiliary plant	467.38 tons coal		129.9 short tons.					
Cost for fuel	$3.89 per ton		$2.85 to $3.90 per ton		$2.25 and $2.50 per cord		$2.47 per cord.	
Water purchased	3,600 gallons		None		240,000		32,000 gallons.	
Cost of water	$5 per 1,000 gallons				25 and 35 cents per 1,000 gallons		28 cents per 1,000 gallons.	
			Remarks. Dredge No. 4 worked only at Gunboat Shoals, Chattahoochee River, and on channel from Apalachicola River to St. Andrews Bay, Fla.		*Remarks.* The dredge was in use in this district for 8 months only.			

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[1] Hired tug.

[2] 1 to 3 barges hired.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Pascagoula.*	*Pelee.*	*Pettus.*	*Port Arthur.*
When built	1909	1908–9	Hull, 1908; cabin and machinery, 1909.	1901.
Where built	Baltimore, Md	South Stillwater, Minn	Hull at Gulfport, Miss.; cabin at Montgomery, Ala.	Port Arthur, Tex.
Builder	Ellicott Machine Co., Baltimore, Md.	United States	United States	Port Arthur Canal & Dock Co.
Time to build	7½ months	9 months	1 year	
Material of hull	Steel	Wood	Creosoted yellow pine	Yellow pine.
Contract cost	$143,500	$36,172		Purchased by the Government in 1909 for $12,000, including pontoons and equipment.
Cost of outfit	$53,331.71, including all attendant plant.	Included in above	$62,352.25	
Length	150 feet	119 feet	135 feet	60 feet.
Beam	40 feet	30 feet	35 feet	28 feet.
Depth	10 feet 6 inches	5 feet	6½ feet	6 feet.
Number, size, and type of propelling engines.	None	None	2 horizontal, direct-acting; cylinders 15 by 72 inches.	None.
Number, size, and type of pumping engines.	One—12 and 20 and 33 by 20 inch, triple expansion.	1 cross compound condensing; diameter 12 and 24 inches, stroke 14 inches.	1 cross compound (Ball Engine Co.) 13 and 20 by 16 inch stroke.	Bucyrus, 2-cylinder, 10 inches and 16 by 8 inches; vertical engine with Worthington condenser.
Boilers:				
Number and type	2 Scotch marine	2 Hawkes	3 Western River type, 5 flues each.	2 Scotch marine.
Length	12 feet	16 feet	30 feet	11 feet.
Diameter	11 feet 6 inches	60 inches	42 inches	66 inches.
Heating surface (total)	3,200 square feet	2,500 square feet	1,755 square feet	
Grate surface (total)	100 square feet	56 square feet	65 square feet	
WORK PERFORMED.				
District to which dredge belongs	Mobile	Rock Island, Ill	Montgomery, Ala	Dallas, Tex.
Location of dredging	See remarks	See remarks	Alabama River, Ala	Port Arthur Ship Canal, Tex., and Johnsons Bayou, La.
Depth before dredging, average	5 to 17 feet	2 feet at zero stage	0.4 feet below zero gauge	Canal, 23.5 feet; bayou 2.5 feet.
Depth after dredging, average	7 to 23 feet	7 feet at zero stage	6 feet below zero gauge	Canal, 27 feet; bayou, 7 feet.
Character of material dredged	Mud, sand, clay, and shells	Sand and gravel	Sand and gravel	Silt and soft blue clay and sand.
Rate of advance per hour	13.2 feet	10 to 30 feet	7.4 feet	3.5 feet.
Amount dredged during year	1,719,013 cubic yards	448,995 cubic yards	199,177 cubic yards	247,084.1 cubic yards.
Average amount dredged:				
Per hour	438.5 cubic yards	200 to 300 cubic yards	153 cubic yards	
Per day	6,848.7 cubic yards	3,000 cubic yards (double crew)	1,844.2 cubic yards	
PLANT.				
Discharge pipe in use	1,100 feet	700 feet	324 linear feet (average)	1,000 feet.

Diameter of discharge pipe	20 inches	17 inches	15 inches	12 inches.
Number of pontons in use	57	12	33 (average)	15.
Revolutions per minute:				
Propelling engines	None	None	20	
Pumping engines	180	240 to 260	240	265.
Type of agitator on cutter head	Bower's, 5-blade type, inclosed cutter.	None	Revolving	None.
Type of suction head	Ellicott	Square, open end, with shoe		Drag.
Revolutions per minute of cutter head	14	None	8 to 10	None.
Average boiler pressure (gauge)	178 pounds	150 pounds	135 pounds	110 pounds.
Kind of fuel used	Bituminous coal	Bituminous coal	Bituminous coal	Fuel oil.
Average vacuum in suction pipe	12 inches	15 inches	10 inches	18 inches.
Average gauge pressure in discharge pipe	21 pounds	15 pounds	13 pounds	None.
Draft of dredge:				
Forward	5 feet 9 inches	2.65 feet	4 feet	3 feet.
Aft	do	2.95 feet	4 feet 3 inches	3 feet 6 inches.
Displacement of dredge	771 tons	250 tons	488 long tons (17,568 cubic feet)	156 tons.
Number of crew	41	18	34	15 (2 crews).
TOWBOATS.				
Name of tug attached to dredge	Tuscaloosa	None	Stern-wheel towboat Alabama	None.
Number of crew	8		16	
Displacement	212 tons		219 long tons	
Draft:				
Forward	6 feet		2 feet 9 inches	
Aft	8 feet		2 feet 10 inches	
LAUNCHES.				
Name	Biloxi	None	Catoma	Sextant.
Length	40 feet		25 feet	30 feet.
Beam	11 feet		7 feet 3 inches	6 feet.
Depth	4 feet 4 inches		2 feet 4 inches	4 feet.
Draft	3 feet 9 inches		12 inches	2 feet 6 inches.
Displacement	25 tons		2 long tons	
BARGES.				
Number of barges in use	2	2	2	3.
Usage	Coal and water	For fuel	Coal lighters and pipe carriers	1 water and 2 fuel oil.
Displacement, light	127 tons	17 tons	112 long tons	
Capacity of all barges	404 tons	150 tons	400 long tons	520 barrels, total of all.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	3,919 hours 57 minutes	73.2 per cent	1,302 hours	5,118 hours 45 minutes.
Handling pipe line	493 hours 6 minutes	14 per cent	385 hours	240 hours 55 minutes.
Handling swinging wires	235 hours 30 minutes	7 per cent	126 hours	23 hours 50 minutes.
Going to and from wharf and anchorage		None	None	
Placing dredge	102 hours	do	34 hours	83 hours 40 minutes.
Waiting for vessels to pass	27 hours 30 minutes	5.8 per cent	27 hours	170 hours 15 minutes.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Pascagoula.*	*Pelee.*	*Pettus.*	*Port Arthur.*
DISTRIBUTION OF TIME LOST.				
Changing location of plant	356 hours 30 minutes	16.3 per cent	914 hours	122 hours.
Bad weather	170 hours 50 minutes	None	462 hours	120 hours 35 minutes.
Washing boilers and ordinary repairs	1,796 hours 4 minutes	26.2 per cent	372 hours	609 hours 25 minutes.
Extraordinary repairs		None	None	55 hours.
Other causes	242 hours 33 minutes	do	18 hours	133 hours 20 minutes.
Sundays and holidays	1,416 hours	57.5 per cent	760 hours	59 days.
COST OF WORK.				
Dredge.				
Pay rolls	$30,753.11	$4,953.62	$9,840.99	$11,814.84
Coal for boilers	13,774.85	5,951.00	3,725.34	5,124.99
Coal for galley	101.18	48.00	55.51	36.00
Water	173.08			32.13
Supplies, subsistence	8,574.87	1,120.00	2,218.34	2,205.69
Supplies, engine room	3,140.93	1,150.00	422.47	750.38
Other supplies	7,375.34		121.50	
Renewals or additions to outfit	5,584.87	450.00	1,976.97	467.88
Ordinary repairs	3,107.49	300.00	279.35	394.46
Laundry, ice, miscellaneous expenses	491.40	100.00	249.70	228.86
Total	$73,077.12	$14,072.62	$18,890.17	$21,055.23
Towboats and launches.				
Pay rolls	4,658.17	None	[1] 1,164.04	([1]).
Coal for boiler	891.22		250.30	
Coal for galley	22.48			
Supplies, subsistence	668.83		176.30	
Supplies, engine room	645.43		29.71	
Launch supplies	610.79			
Renewals of or additions to outfit	25.00		56.25	
Ordinary repairs	536.69			
Other supplies	186.21			
Laundry, ice, miscellaneous expenses, etc.	83.73		11.39	
Total	$8,328.55		$1,687.99	
BARGES.				
Ordinary repairs to barges	39.13			
Total field cost	$81,444.80	$14,572.62	$20,578.16	$21,055.23

Total field cost per cubic yard	$0.0474	$0.031	$0.1033+	$0.085+.
Office expenses, superintendence, surveys, etc.	12,772.58	2,900.00	1,197.39	2,178.84
Extraordinary repairs to dredge	2,361.05	2,102.87		660.00
Extraordinary repairs to towboats and launches.	830.50			
Extraordinary repairs to barges				245.76
Total	$97,408.93	$19,075.40	$21,775.55	$24,139.83
MISCELLANEOUS.				
Gross cost per cubic yard	$0.0567	$0.043	$0.1093	$0.09761.
Fuel consumed by dredge	3,801.65 tons	1,457 tons	1,298.33 short tons	5,948.82 barrels.
Fuel consumed by auxiliary plant	250.33 tons		688.11 short tons	
Cost of fuel	$3.65 per ton	$4.05 per ton	$2.91 per ton	$0.85 and $0.90 per barrel.
Water purchased	576,933 gallons			9,180 gallons.
Cost of water	$0.30 per 1,000 gallons			$0.35 per 1,000 gallons.

Remarks.

Location of dredging: Pascagoula River, Pascagoula Ship Channel, Dog River, Miss.; Biloxi Harbor, Miss.; Gulfport Harbor, Miss.; Wolf River, Miss.; Jordan River, Miss.; East Pearl River, Miss.

Remarks.

Channel dredging was done at following points on Mississippi River: Head of Belvidere slough (mile 93); head of Island 65 (mile 112); above Island 44 (mile 90); West Newton (miles 94-95); below Island 44 (mile 92); and vicinity of Dakota (mile 135); Island 54 (mile 105); Fountain City (mile 108-109).

Remarks.

Following table shows location of and quantities dredged:

Location.	Miles below Montgomery.	Dredged.
		Cu. yds.
Hobbs Island	170	103,954
Jewetts bar	241	53,890
Williamson bar.	248	14,074
Middle Gause bar	3½	27,259

The towboat was employed, greater part of time, on work other than waiting on dredge; it is estimated that one-eighth of its expenses ($13,503.92) should be charged to dredging.

[2] One-eighth of towboat expenses.

Remarks.

[1] Included in cost of dredge work.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Ram.*	*San Pedro.*	*Selma.*	*St. Croix.*
When built	1893; new steel hull built in 1900.	1905	1897–98	1898.
Where built	Jeffersonville, Ind.; new steel hull, Grafton, Ill.	Machinery built at Baltimore, Md.; hull built and machinery placed at Los Angeles, Cal.	Jeffersonville, Ind	St. Paul Park, Minn.
Builder	The Bucyrus Steam Shovel & Dredge Co.	Ellicott Machine Co., Baltimore, Md.	The Bucyrus Co., South Milwaukee, Wis.	Government.
Time to build	8 months	15 months	10 months	
Material of hull	Originally wood; now steel	Wood	Steel	Wood.
Contract cost	$69,500; new steel hull, $14,650; rebuilding, $20,000; total, $104,150.	$98,400	$102,400	$6,427.77.
Cost of outfit	Included in contract cost	$20,321.78	$117,151.06 (finished cost)	$2,193.42.
Length	125 feet	140 feet 8 inches	160 feet	80 feet.
Beam	30 feet	40 feet 8 inches	40 feet	22 feet.
Depth	7 feet	10 feet 7 inches	6 feet	5 feet.
Number, size, and type of propelling engines.	Two 15 by 54 inch western river type.	None	None	Two 9 by 36 inch horizontal engine.
Number, size, and type of pumping engines.	One 14 and 28 by 20 inch compound condensing.	Triple expansion, marine type, cylinders 12, 20, and 33 inches diameter, 20-inch stroke, rated at 600 horsepower at 200 revolutions per minute.	Two 15 and 26 by 18 inch horizontal, noncondensing, cross compound, direct connected.	One 10 by 12 inch vertical engine; 45 I. H. P.
Boilers:				
Number and type	2 gunboat type	Two 400-horsepower semimarine Babcock & Wilcox. (Drums, 42 by 96 inches; 14 tubes 4 inches by 10 feet; 126 tubes 4 inches by 12 feet.)	6 Mississippi River type	1 Scotch marine.
Length	17 feet		28 feet	144 inches.
Diameter	5 feet		48 inches; 5 flues 11 inches diameter.	78 inches.
Heating surface (total)	964 square feet	4,000 square feet	3,925 square feet	370 square feet.
Grate surface (total)	28 square feet	88 square feet	112 square feet	11⅜ square feet.
WORK PERFORMED.				
District to which dredge belongs	Fourth Mississippi River district	Los Angeles, Cal	St. Louis, Mo	St. Paul, Minn.
Location of dredging	Mouth of Red River, La	Los Angeles Harbor, Cal		Minnesota River between Savage and mouth of river, near Mendota; St. Croix River at Catfish bar, opposite Afton, Minn.
Depth before dredging, average	10 feet above zero of gauge	21 to 25.5 feet	7½ feet	1½ feet.
Depth after dredging, average	5 feet below zero of gauge	31 feet	10 feet	3 feet.
Character of material dredged	Sand and gravel	Sand rock, yellow and blue clay, shell, quicksand, bowlders, coarse yellow and gray sand, and silt.	Sand and gravel	Gravel and sand.
Rate of advance per hour	9 feet		160 feet	7½ feet

Amount dredged during year	Approximately 85,000 cubic yards.	744,250 cubic yards	850,700 cubic yards	8,678 cubic yards.
Average amount dredged:				
Per hour	200 cubic yards	103.4 cubic yards	1,000 cubic yards	10.9 cubic yards.
Per day	1,736 cubic yards	2,481 cubic yards (300 working days).	12,000 cubic yards	159.2 cubic yards.
PLANT.				
Discharge pipe in use	75 feet	100 sections (24-foot)	300 feet	110 feet.
Diameter of discharge pipe	16 inches	20 inches	28 inches	10 inches.
Number of pontoons in use	None	28	9	4.
Revolutions per minute:				
Propelling engines	18			28.
Pumping engines	120	180	135	265.
Type of agitator or cutter head	Cone with knives	Cage, Ellicott & Norbom clay	Water jet sand agitator	6-blade.
Type of suction head	Funnel in interior of revolving cutter head.	Round	Dustpan	10-inch pipe.
Revolutions per minute of cutter head	16 to 20	12 to 13		26.
Average boiler pressure (gauge)	150 pounds	200 pounds	125 pounds (140 pounds allowed).	110 pounds.
Kind of fuel used	Pittsburgh coal (run of mine)	Crude oil	Standard Illinois bituminous coal (run of mine).	Wood.
Average vacuum in suction pipe	20 inches	6 to 14 inches	15½ inches	8 inches.
Average gauge pressure in discharge pipe.	None	20 to 30 pounds	5 pounds	5 pounds.
Draft of dredge:				
Forward	4 feet	6 feet	4 feet	3 feet.
Aft	4½ feet	do	do	3 feet 2 inches.
Displacement of dredge	419 tons	900 tons	600 tons (2,240 pounds; 21,600 cubic feet).	130 tons.
Number of crew	Single, 16; double, 28	36	54	11.
TOWBOATS.				
Name of tug attached to dredge	No tug used		Cahokia. Stern-wheel steam tender, no quarters, not powerful enough to tow dredge.	
Number of crew			5 included in dredge crew	
Displacement			90 tons (2,240 pounds each)	
Draft:				
Forward			3 feet	
Aft			do	
LAUNCHES.				
Name	None used	Pedrito	None attached	
Length		26 feet		
Beam		7 feet		
Depth		40 inches		
Draft		2½ feet		
Displacement		2.2		
BARGES.				
Number of barges in use	None used	4	2	6.
Usage		Fuel oil, fresh water, derrick barge, and work barge.	Fuel	1 quarterboat (blacksmith shop), 1 wood barge, 4 pontons.
Displacement, light		20.3 to 41.5 tons	125 tons (2,240 pounds)	69 tons.
Capacity of all barges		110 tons	300 tons each (2,240 pounds)	90 tons.

Name	*Ram.*	*San Pedro.*	*Selma.*	*St. Croix.*
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	74 per cent	4,174 hours 10 minutes	922 hours	43¼ days.
Handling pipe line		Included in placing plant		6 days.
Handling swinging wires	5 per cent	592 hours 20 minutes		
Going to and from wharf and anchorage		Included in placing plant		
Placing dredge	1 per cent	378 hours 35 minutes		5 days.
Waiting for vessels to pass	20 per cent	160 hours 20 minutes		54½ days.
DISTRIBUTION OF TIME LOST.				
Changing location of plant	None	378 hours 35 minutes	3,470 hours (not pumping)	7 days.
Bad weather	do	No time lost		
Washing boilers and ordinary repairs	Attended to on Sunday	1,087 hours 55 minutes		5 days.
Extraordinary repairs	None			19 days.
Other causes	do	86 hours 40 minutes		Handling wood barge 3 days.
Sundays and holidays	6 days	1,560 hours		24½ days.
COST OF WORK.				
Dredge.				
Pay rolls	$3,138.04	$31,726.67	$13,971.01	$3,011.42
Coal for boilers	1,458.51	[1]17,200.85	6,050.69	388.39
Coal for galley	24.00		93.97	44.79
Water		270.31		
Supplies, subsistence	1,149.12		4,401.35	681.58
Supplies, engine room	91.75	2,162.08	1,362.00	38.32
Other supplies	17.48			
Renewals or additions to outfit	351.43	8,525.24	4,538.33	384.11
Ordinary repairs	2,891.55	4,294.66	204.85	316.21
Laundry, ice, miscellaneous expenses	1,472.81	64.34		26.60
Towing dredge				181.00
Total	$10,594.69	$64,244.15	$30,562.20	$5,072.42
Towboats and launches.				
Pay rolls		795.00	1,830.00	
Coal for boilers			939.70	
Coal for galley				
Supplies, subsistence				
Supplies, engine room		269.15		
Launch supplies				
Hire of launch while Pedrito was undergoing repairs.		56.00		
Renewals of or additions to outfit				
Ordinary repairs		80.66	508.74	

Laundry, ice, miscellaneous expenses, etc.								
Total				1,200.81		3,278.44		
Barges.								
Ordinary repairs to barges			1,389.40		439.20			
Total field cost		6,130.97		66,834.36		34,279.84		
Total field cost per cubic yard	$0.0721+		$0.087+		$0.04		$0.584	
Office expenses, superintendence, surveys, etc.	4,463.72		2,838.84		1,904.86			
Extraordinary repairs to dredge					67.48			
Extraordinary repairs to towboats and launches.					404.00			
Extraordinary repairs to barges								
Total		10,594.69		$69,673.20		[1] $36,656.18		
Miscellaneous.								
Gross cost per cubic yard	$0.1246+		$0.091		$0.06½		$0.78.6.	
Fuel consumed by dredge	3,706 barrels		17,200.85 barrels		1,319.76 tons (2,000 pounds each).		192 cords.	
Fuel consumed by auxiliary plant	None		$1 per barrel		402.6 tons (2,000 pounds each)			
Cost of fuel	40 cents per barrel		1,081,209 gallons		$2.57 per ton (2,000 pounds)		$2.25 per cord.	
Water purchased	None							
Cost of water	do		$0.25 per 1,000 gallons					
Alterations of dredge to permit of dredging to increased depth.			$2,859.37					

Remarks.

The cutter head is fixed rigidly to the dredge and the entire machine swings when operating from a spud set near the stem. By this means the dredge makes a cut of from 100 to 125 feet wide and about 7 feet deep, discharging the material from a discharge pipe 75 feet long suspended from the dredge. The machine works with and not against the current.

Remarks.

[1] Crude oil for boilers, $17,200.85.

Remarks.

Localities dredged and work done at each:

	Cubic yards.
Whitehouse	181,200
Meramec River	36,400
Kemper	18,000
Danby	47,700
Cambria Hollow	61,000
Rubicon Hollow	36,100
Illinois Incline (Illinois Southern Ry.)	25,300
Stanton	27,600
Coles Mill	74,400
Crawford	232,600
Neelys	70,500
Thompson	45,900
	856,700

Remarks.

Dredge St. Croix not in operation since Oct. 31, 1910.

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[1] In addition to the above amount of $36,656.18, the sum of $13,873.72 for proportionate charges of engineer office, general expense, and care and use of plant, engineer depot, towboats, etc., and $4,625.45 for deterioration, is properly chargeable to operation and care of the dredge, and is included in the gross cost of output per cubic yard.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Thebes.*	*Tortoise* (formerly *No. 5*).	*Uncle Sam.*	*Vesuvius.*
When built	1897–98.	1905 and 1910.	1899.	1909.
Where built	Jeffersonville, Ind.	Superior Entry, Wis.	Jersey City, N. J.	Fountain City, Wis.
Builder	The Bucyrus Co., South Milwaukee, Wis.	United States.		United States.
Time to build	13 months.	Original hull, 3 months.		1 year.
Material of hull	Steel.	Wood.	Wood.	Creosoted open-tank fir.
Contract cost	$102,400.	No contract for complete dredge.	$18,855.94.	$29,996.
Cost of outfit	$114,574.95 (with outfit).	Original hull and equipment, $10,698.65; rebuilding, 1910, cutter machinery, etc., $14,155.32; 1911 additional boiler and discharge pipe $2,316.41; total, $27,170.38.	$3,208.16.	$3,096.
Length	160 feet.	102 feet.	85 feet.	114.8 feet.
Beam	40 feet.	24 feet.	34 feet.	30 feet.
Depth	6 feet.	5 feet 3½ inches.	7 feet.	5 feet.
Number, size, and type of propelling engines.	None.	None.		
Number, size, and type of pumping engines.	Two 15 and 26 by 18 inch stroke, horizontal, noncondensing, cross compound, direct connected.	Double 12 by 12 inch direct connected to 15-inch centrifugal pump with 50-inch impeller.	One—12 and 26 by 12 inch compound.	1 cross compound condensing, diameter 12 and 24 inch, stroke 14 inches.
Boilers:				
Number and type	6 Mississippi River type.	One 150-horsepower horizontal fire box, locomotive type and one 100 horsepower, same.	1 Scotch.	2 Bonson boilers.
Length	28 feet.	Length, 23 feet 10 inches and 21 feet 2 inches, respectively.	11 feet.	16 feet.
Diameter	48 inches, 5 flues, 11 inches diameter.	72 and 60 inches, respectively.	10 feet.	60 inches.
Heating surface (total)	3,925 square feet.	2,672 square feet.		2,415.76 square feet.
Grate surface (total)	112 square feet.	59.8 square feet.		50.62 square feet.
WORK PERFORMED.				
District to which dredge belongs	St. Louis, Mo.	Duluth, Minn.	Philadelphia.	Rock Island, Ill.
Location of dredging		Superior Entry, Wis.	Delaware River.	See remarks.
Depth before dredging, average	5½ feet.	7 feet.	(Rehandling).	2 to 6 feet below low water.
Depth after dredging, average	8½ feet.	23 feet.		4½ to 11 feet below low water.
Character of material dredged	Sand and gravel, except at Maple Island, where blue clay was found.	Mostly sand, some clay and peat.	Mud, sand, gravel, and cobble.	Sand, mud, and gravel.
Rate of advance per hour	120 feet.	1.53 feet.		6 to 16 feet.
Amount dredged during the year	546,100 cubic yards.	189,666 cubic yards.	238,259 cubic yards.	224,604 cubic yards.
Average amount dredged:				
Per hour	700 cubic yards.	75.1 cubic yards.	167 cubic yards.	62 to 118 cubic yards.
Per day	8,000 cubic yards.	1,353 cubic yards.	1,288 cubic yards.	1,000 to 2,360 cubic yards.

PLANT.				
Discharge pipe in use	300 feet	2,200 feet	1,500 feet	600 feet.
Diameter of discharge pipe	28 inches	15 inches	12 inches	18 inches.
Number of pontons in use	9	54	26	12.
Revolutions per minute:				
Propelling engines				
Pumping engines	140	240 to 300	170	199.
Type of agitator or cutter head	Water-jet sand agitator	Spiral bladed	Built-up	Plain square.
Type of suction head	Dustpan	Oval	None	
Revolutions per minute of cutter head		10	30	
Average boiler pressure (gauge)	140 pounds (allowed)	105	125 pounds	140 pounds.
Kind of coal used	Standard Illinois bituminous, run of mine.	Youghiogheny & Schuylkill run of mine.	Semibituminous	Bituminous.
Average vacuum in suction pipe	15½ inches	14 inches	14 inches	20 inches.
Average gauge pressure in discharge pipe.	5 pounds	27 pounds	20 pounds	10 pounds.
Draft of dredge:				
Forward	4 feet	3 feet 7 inches	5 feet	34 inches.
Aft	do	2 feet 11¼ inches	5 feet 2 inches	Do.
Displacement of dredge	600 tons (2,240 pounds; 21,600 cubic feet).	196 long tons	450 tons	290 long tons.
Number of crew	54	7	14	16.
TOWBOATS.				
Name of tug attached to dredge	Cinque Hommes (stern-wheel steam tender, no quarters, not powerful enough to tow dredge).	Essayons (used occasionally)	None	None regularly.
Number of crew	5, included in dredge crew	5		
Displacement	90 tons (2,240 pounds each)	129 tons		
Draft:				
Forward	3 feet	6 feet		
Aft	do	10 feet 6 inches		
LAUNCHES.				
Name	None attached	Cord (used occasionally)	None	
Length		20 feet 6 inches		
Beam		5 feet 5 inches		
Depth		2 feet 7 inches		
Draft		20 inches		
Displacement				
BARGES.				
Number of barges in use	2	1	1	2.
Usage	Fuel	Carrying coal	Coal and water scow No. 5	Coal barges.
Displacement, light	125 tons (2,240 pounds)	41 tons	40.7 tons	22 long tons.
Capacity of all barges	300 tons each (2,240 pounds)	180 tons	89.3 tons	100 long tons.
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	1,289 hours	2,085 hours 25 minutes	1,427 hours	2,066 hours.
Handling pipe line		187 hours 5 minutes	18 hours	254 hours.
Handling swinging wires		57 hours 5 minutes		
Going to and from wharf and anchorage			32 hours	
Placing dredge		30 hours 35 minutes	96 hours	39 hours.
Waiting for vessels to pass				35 hours.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Thebes.*	*Tortoise* (formerly *No. 5.*)	*Uncle Sam.*	*Vesuvius.*
DISTRIBUTION OF TIME LOST.				
Changing location of plant	1,279 hours not pumping	209 hours, 50 minutes 322 hours, 40 minutes 536 hours		282 hours.
Bad weather			420 hours	17 hours.
Washing boilers and ordinary repairs			48 hours	71 hours.
Extraordinary repairs and renewals			372 hours	
Other causes			1,259 hours[1]	16 hours.
Sundays and holidays			708 hours	675 hours.
COST OF WORK.				
Dredge.				
Pay rolls	$11,985.33	$9,065.75, dredge operation	$6,701.15	$6,236.39
Coal for boilers	4,173.21	$7,295.40	1,255.96	2,817.27
Coal for galley	122.73	None		2.50
Water		No cost		
Supplies, subsistence	3,989.12	None	1,615.89	1,410.30
Supplies, engine room	1,821.53	$630.09	251.76	375.69
Other supplies			850.00	217.51
Renewals or additions to outfit		[1] 5,935.81	1,689.60	200.67
Ordinary repairs	4,902.61	[1] 1,826.90	1,229.91	307.89
Laundry, ice, miscellaneous expenses	259.21	None	15.04	93.74
Total	$27,253.74	$24,753.95	$13,709.31	$11,661.96
Towboats and launches.				
Pay rolls	2,390.00	One-eighth of cost of running during season: Tug...... $815.90 Launch.. 75.00 Total.. 890.90		1,973.63
Coal for boiler	1,227.26			640.67
Coal for galley				
Supplies, subsistence				435.81
Supplies, engine room				34.41
Other supplies				
Launch supplies				62.33
Renewals of or additions to outfit				74.01
Ordinary repairs	664.42			73.82
Laundry, ice, miscellaneous expenses, etc.				38.60
Total	4,281.68	890.90		3,333.28
Barges.				
Ordinary repairs to barges	573.60	None		
Total field cost	32,109.02	25,644.85	13,709.31	14,995.24

Total field cost per cubic yard	$0.06	$0.1352 [2]	$0.0575	$0.067.
Office expenses, superintendence, surveys, etc.	$1,904.86	$4,212.03 [3]	$615.00	$002.48
Extraordinary repairs to dredge	301.53	Small included, in renewals.		
Extraordinary repairs to towboats and launches.	404.00			
Extraordinary repairs to barges				
Total	[1] $34,719.41	$29,856.88	$14,324.31	$15,597.72
Miscellaneous.				
Gross cost per cubic yard	$0.095	$0.1574	$0.06	$0.069.
Fuel consumed by dredge	2655.65 tons (2,000 pounds each)	1,871.1 tons	467.57 tons	1,155 tons.
Fuel consumed by auxiliary plant	525.8 tons (2,000 pounds each)			310 tons.
Cost of fuel	$2.57 per ton (2,000 pounds)	$3.45 per ton, 1910; $3.20 per ton, 1911.	$2.98 per ton (2,000 pounds)	$1.90 to $2.88 per ton (2,000 pounds).
Water purchased		None		
Cost of water				
	Remarks.	*Remarks.*	*Remarks.*	*Remarks.*
	Localities dredged and work done at each: Cubic yards. Maple Island .... 2,770 Whitehouse .... 50,700 Kemper .... 29,600 Danby .... 36,930 Illinois Incline (Illinois Southern Ry.) 3,020 Baumstark .... 107,430 Stanton .... 246,620 Coles Mill .... 10,430 Thompson .... 58,600 546,100 [1] In addition to the above amount of $34,719.41, the sum of $12,882.69 for proportionate charges of engineer office general expense and care and use of plant, engineer depot, towboats, etc., and $4,250.38 for deterioration, is properly chargeable to operation and care of the dredge and is included in the gross cost of output per cubic yard.	[1] Includes both material and labor. [2] Total field cost per cubic yard without figuring in cost of renewals, additions, and extraordinary repairs, $0.1039. [3] Administration and inspection.	[1] Laid up from July 1 to Aug. 15, 1910.	Dredging in Rock River Pool, Moline Pool, and at following places in Mississippi River: Valley crossing, mile 200; Ferry Slough, mile 228; Guttenberg, miles 232-233; Vicksburg, Dubuque, miles 253, 260, 262, 263, 265; Nine Mile Island, mile 272; Vicksburg, Apple River, mile 299; Vicksburg, Dark Slough, mile 314.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Wahalak.*	*Warroad.*	*Zeta.*	Pump boat *No. 1* (10-inch suction).
When built	1910	1904	1898	1909-10.
Where built	Baltimore, Md	Warroad, Minn	Grafton, Ill	Muscle Shoals Canal, Ala.
Builder	Ellicott Machine Co., Baltimore, Md.	Government	Springfield Boiler & Manufacturing Co.	United States.
Time to build	8 months	11 months	15 months	2½ months.
Material of hull	Steel	White oak and fir	Steel	Wood.
Contract cost	$159,000;[1] $161,039.86[2]	$31,948.20 (without outfit)	$109,000	$10,560.53 (built by hired labor).
Cost of outfit	$1,905.98;[3] $23,081.25[4]	$1,913.89	$3,000	$55.
Length	150 feet	100 feet	157 feet	90 feet.
Beam	40 feet	27 feet	40 feet	24 feet.
Depth	11 feet 6 inches	8½ feet	7 feet 6 inches	3 feet 6 inches.
Number, size, and type of propelling engines.	None	Two—10 by 60 inches; horizontal	None	None.
Number, size, and type of pumping engines.	1 triple expansion, 14, 22½, 40 by 20.	Two—9 by 9 inches; direct connected, 75 I. H. P.	Two—16 and 26 by 18 inches; horizontal tandem compound.	Plain slide valve, 13-inch diameter, 18-inch stroke.
Boilers:				
Number and type	4 Scotch marine boilers	2 Scotch marines	6 Mississippi River	1; locomotive.
Length	10 feet 6 inches	109 inches	28 feet	20 feet 3 inches.
Diameter	11 feet 4 inches	72 inches	48 inches	59 inches.
Heating surface (total)	4,752 square feet	600 square feet	3,000 square feet	1,080 square feet.
Grate surface (total)	150.8 square feet to each boiler	23 square feet	143 square feet	25 square feet.
WORK PERFORMED.				
District to which dredge belongs	Mobile	St. Paul, Minn	Mississippi River Commission	Nashville, Tenn.[1]
Location of dredging	Mobile Bay, Ala	Warroad Harbor and River	Mississippi River below Cairo	Locks 1 and 2, Cumberland River.
Depth before dredging, average	5.5 feet	3 feet	See remarks	5 feet.
Depth after dredging, average	28 feet	9 feet	do	8 feet.
Character of material dredged	Mud and sand	Sand, clay, muskeg, and bowlders.	Sand, blue mud, and gravel	Sand, leaves, and mud from gate recess of lock chambers.
Rate of advance per hour	5.6 feet (within theoretical section).	5 to 10 feet	212 feet	
Amount dredged during year	1,005,935 cubic yards, place measurement.	86,144 cubic yards	105,541 cubic yards	See remarks.
Average amount dredged:				
Per hour	764.4 cubic yards	95.8 cubic yards (112.5 days)	598 cubic yards	Do.
Per day	12,896.6 cubic yards	765.7 cubic yards (112.5 days)		Do.
Plants.				
Discharge pipe in use	1,200 feet	200 linear feet	700	None.
Diameter of discharge pipe	20 inches inside diameter	12 inches	32 inches	Do.
Number of pontoons in use	61		14	Do.
Revolutions per minute:				
Propelling engines	None	32	None	Do.
Pumping engines	145 R. P. M	265	159	Do.
Type of agitator or cutter head	Ellicott spiral type	3 steel blades, parallel with shaft	Water jet agitator	Do.
Type of suction head	Ellicott	T shape	Upstream with water jets	Do.

Revolutions per minute of cutter head	13	60		100 pounds.
Average boiler pressure (gauge)	185 pounds	130 pounds	180 pounds	Bituminous.
Kind of coal used	Stoutz Mountain, bituminous	Wood	Pittsburgh, bituminous	Unknown.
Average vacuum in suction pipe	15 inches	16 inches	8 inches	Do.
Average gauge pressure in discharge pipe.	23 pounds	15 pounds	9 pounds	
Draft of dredge:				
Forward	5 feet 8 inches	3 feet	3 feet 8 inches, 5 feet from bow	24 inches.
Aft	5 feet 4 inches	4 feet	4 feet 8 inches, 2 feet from stern	Do.
Displacement of dredge	808 tons with 5½ feet draft	260 tons	650 tons	112.86 tons.
Number of crew	44	11	35	Crew of steamboat operate the dredge.
TOWBOATS.				
Name of tug attached to dredge	Horace Harding		Choctaw	None.
Number of crew	8 men		11	
Displacement	215 long tons		560 tons	
Draft:				
Forward	6 feet 4 inches		4 feet, 27½ feet from bow	
Aft	8 feet 2 inches		4 feet 7 inches, 26 feet from stern	
LAUNCHES.				
Name	Biloxi	Bull Calf		None.
Length	40 feet	23 feet		
Beam	11 feet	6 feet		
Depth	4 feet 4 inches	3 feet 4 inches (molded depth)		
Draft	3 feet	Forward, 1 foot 2 inches; aft, 2 feet 4 inches.		
Displacement	25 tons	1 ton		
BARGES.				
Number of barges in use	2	13	1	None.
Usage	Coal and water	11 pipe floats, 1 wood barge, 1 derrick boat.	Coal	
Displacement, light	Both barges 116 tons	74 tons		
Capacity of all barges	382 tons	130 tons	600 tons	
DISTRIBUTION OF EFFECTIVE WORKING TIME.				
Pumping	1,316 hours 1 minute	97½ days (July 28, 1910–June 30, 1911).	176 hours	See remarks.
Handling pipe line	121 hours 20 minutes	15 days		Do.
Handling swinging wires	47 hours 36 minutes			Do.
Going to and from wharf and anchorage				Do.
Placing dredge	6 hours 55 minutes		57 hours	Do.
Waiting for vessels to pass	1 hour 33 minutes		None	Do.
DISTRIBUTION OF TIME LOST.				
Changing location of plant		1 day		See remarks.
Bad weather	13 hours 15 minutes	3 days		Do.
Washing boilers and ordinary repairs	183 hours 53 minutes	8 days	64 hours (washing boilers not given).	Do.
Extraordinary repairs	204 hours 44 minutes			Do.
Other causes	114 hours 43 minutes			Do.
Sundays and holidays	360 hours	27½ days		Do.

TABLE II.—*Report of operations of pipe-line hydraulic dredges for the fiscal year ending June 30, 1911*—Continued.

Name			*Warroad.*		*Zeta.*		Pump boat *No. 1* (10-inch suction).
COST OF WORK.							
Dredge.							
Pay rolls	$6,041.20		$3,900.85		$3,806.76		See remarks.
Coal for boilers	4,912.47		958.18		3,780.76		Do.
Coal for galley	31.08		72.00		16.00		Do.
Water	(1)				20.00		Do.
Supplies, subsistence	2,224.22		718.72				Do.
Supplies, engine room	1,703.85		57.02				Do.
Other supplies	4,765.07						Do.
Renewals or additions to outfit	517.97		1,155.55				Do.
Ordinary repairs	122.54		193.58				Do.
Laundry, ice, miscellaneous expenses	150.50		13.80				Do.
Total		$20,468.90		$7,069.70		$7,623.52	
Towboats and launches.							
Pay rolls	1,765.56				905.00		Do.
Coal for boiler	467.18				889.00		Do.
Coal for galley	10.29				16.00		Do.
Supplies, subsistence	254.96						Do.
Supplies, engine room	141.57		27.68				Do.
Launch supplies	148.49						Do.
Renewals of or additions to outfit	142.02						Do.
Ordinary repairs	33.50		6.38				Do.
Laundry, ice, miscellaneous expenses, etc.							Do.
Total		2,965.91		34.06		1,830.00	
Barges.							
Ordinary repairs to barges	23,434.81						
Total field cost					9,453.52		
Total field cost per cubic yard	$0.0233		$0.082		.09		
Office expenses, superintendence, surveys, etc.	1,239.44				4,183.53		
Extraordinary repairs to dredge					[1] 1,597.03		
Extraordinary repairs to towboats and launches.					[1] 5,950.67		
Extraordinary repairs to barges	26.40						
Total		24,700.65				21,184.15	

Miscellaneous.				
Gross cost per cubic yard	$0.0246	$0.09	$0.20	50 cents.
Fuel consumed by dredge	1,445.5 tons	343 cords	320 barrels coal in 24 hours	Not kept separate.
Fuel consumed by auxiliary plant	136.8 tons (Horace Harding)			Do.
Cost of fuel	Dredge, $3.42; tug, $3.40	$3 per cord		None.
Water purchased				
Cost of water	Included in cost of coal			

Remarks.

Dredge Wahalak started to work in Mobile Bay dredging on cut-off channel at Beacon 16, working north. Work was commenced on Mar. 24, 1911, 6 a .m. Distribution of time is compiled from that time.

[1] Original contract cost.

[2] First cost, including necessary changes.

[3] Galley, mess, and crews' outfit.

[4] Cost of pipe line and barges.

[5] Included in cost of coal.

Working in the following places in 1910:

Locality.	Miles below Cairo.	Average depth.	
		Before dredging.	After dredging.
		Feet.	*Feet.*
Josie Harry Chute	243	7.5	11.0
Catfish Point Crossing	422	9.0	14.0
Moss Lake Crossing	455	9.0	11.0

NOTE.—The cost per cubic yard, based on total field cost or on gross cost, gives no idea of the efficiency of the dredge, as the river conditions may be such that actual dredging may occur only a few days in a whole season. Taking as a basis the cost of actual time dredging, placing plant, changing cuts, passing boats, and making up tow, the cost per cubic yard for this dredge would be $0.032.

[1] Includes all repairs made when not in field.

Remarks.

The dredge was operated by the crew of the U. S. steamer Cumberland, assisted by the lock force, and was engaged from July 19 to Aug. 1 in removing leaves, sand, and mud from locks Nos. 1 and 2. Six hundred cubic yards of material was removed at a total cost of $302.30 for labor, coal, and supplies; a unit cost of 50 cents.

The dredge has been transferred to the Tennessee River, where it can be used to advantage.

[1] Pump boat transferred from Nashville, Tenn., district to Chattanooga, Tenn., district June June 27, 1911.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911.*

Name	*Addison.*	*Ajax.*	*Ajax.*	*Alabama.*	*Albany.*
District	Wheeling, W. Va	Rock Island	Wilmington, N. C	Chattanooga, Tenn	Montgomery, Ala.
Length	75 feet	73 feet	82 feet	80 feet	70 feet.
Beam	30 feet	26 feet	32 feet 8 inches	38 feet	30 feet.
Depth	7 feet 2 inches	6 feet	10 feet 4 inches	6 feet	4 feet 9 inches.
Draft:					
Forward	38 inches	3 feet 4½ inches	5 feet 8 inches	3 feet 6 inches	18 inches.
Aft	30 inches	1 foot 7½ inches	5 feet 2 inches	do	Do.
Displacement	177 tons	124 tons	400 tons	244 long tons	75 long tons, or 2,700 cubic feet.
Builder	United States (Osgood machinery).	H. S. Brown	Copeland & Bacon, of New York, built machinery, and a phosphate rock company built hull.	Machinery, the Bucyrus Co., South Milwaukee, Wis.	United States Engineer Department.
Where built	On Kanawha River, W. Va.	Quincy, Ill	Port Royal, S. C	A. R. Perry, Chattanooga, Tenn.; hull by United States.	Columbus, Ga.
When built	1880; rebuilt 1910	1876	1884	1891	1908.
Time to build	To rebuild, about 5 months	No record		1 year	4 months.
Material of hull	Wood	Wood	Wood	Pine wood; cost $4,800	Wood.
Contract cost		$11,300		Of machinery; $17,500	
Finished cost, with outfit	About $14,000	$11,300	Dredge was purchased with outfit in 1897 for $16,500, but price did not include cost of tug and scows.	$22,300	$11,730.84.
Bucket:					
Type	Dipper	Dipper	Clamshell	Chain of 24 buckets and 24 links.	Orange-peel bucket.
Capacity	1½ cubic yards	1½ yards	5 cubic yards	5 cubic feet each	1 cubic yard.
Length of boom	31 feet	30 feet	48 feet	None	60 feet.
Dimensions of main hoisting engine cylinders.	9 by 18 inches	8 by 18 inches	18 and 24 inches	10 by 14 inches	8¼ by 10 inches.
Boilers:					
Number	1	1	1	1	1.
Type	Locomotive fire box	Upright, tubular	Locomotive	Marine	Upright.
Size	54 inches by 15 feet 6 inches	54 inches by 10 feet	Length, 18 feet 11¾ inches; inside width fire box, 6 feet 10⅜ inches.	60 inches diameter, 17 feet long.	50 inches diameter, 10 feet long; 128 flues, 2 inches diameter, 5 feet 9 inches long.
Nominal horsepower	60	40	About 125.	40	30.
Working steam pressure.	90 pounds	120 pounds	125 allowed, but work with 80 pounds.	90 pounds	100 pounds.
Average capacity per hour	24 cubic yards	40 cubic yards clay	165.5 cubic yards	213 cubic yards	50 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	15,306½ cubic yards	35,987 cubic yards	542,027 cubic yards of sand and mud, 161 stumps, and 106 logs.	137,088 cubic yards	18,531 cubic yards.

Location of dredging	Kanawha River	Moline pool and Rock River pool.	River channels below Wilmington.	Muscle Shoals Canal, Ala.	Flint River, below Albany, Ga., miles 52 to 56.
Number of men in crew	6	8	11	7	7.
Cost of repairs during year	$114.94	$1,402.41	No special repairs made	$1,920.62	$341.87.
Operating cost for year	$3,605.82	$6,863.95	Dredge $17,968.82, tugs $10,507.14, total $28,475.96.	$4,967.02	$4,091.13.
Character of material dredged.	Compacted gravel, sand, and stone.	Clay, mud, and rock	Sand, mud, clay, stumps	Soft mud and gravel	Rock broken up by blasting.
Average cost per cubic yard.	$0.243	$0.191	For operation 5.3 cents, allowing nothing for the removal of logs and stumps.	$0.0502	$0.239.
	Remarks. The dredge Addison was only engaged in active work 91 days during the year. The remainder of the time was spent as follows: In winter quarters 186 days; rebuilding hull and cabin, transferring machinery, etc., 88 days. The cost of running the dredge alone for the year was $3,720.76. To this amount should be added the cost of 81 days' attendance by the towboat James Rumsey $1,510, giving a total cost of $5,230.76, or an average cost of 34.11 cents per cubic yard for dredging and dumping. Again, of the 91 days the dredge was working, 12 days' time was lost by reason of high water and repairs, reducing the net working time to 79 days. Light cuts (skinning) in hard, compacted material, time lost in changing location, and short season all tend to lower yardage and increase yard cost.	*Remarks.* Dredging operations were in Rock River pool and Moline pool.	*Remarks.* The following is the total cost of the dredging: Operating dredge Ajax, $17,968.82; operating tugs, $10,507.14; superintendence and surveys, $2,176; main office expenses, $689; part of dredge Jacksonville's expenses for rehandling 215,561 cubic yards, $8,622.48; total, $39,963.38. Making the total cost 7.4 cents per cubic yard. Minor repairs were made to this plant as follows, which is included in the cost of operating: Minor repairs to plant, $2,708.96; minor repairs to scows, $852.20; minor repairs to tug, $1,009.52; total, $4,570.68. Special repairs were made to the tug Cynthia, a tender for this dredge, at a cost of $13,207.93 which is not included in the cost of the work.	*Remarks.* This dredge was operated for about 9 months of the past year. The machinery was given a thorough overhauling and 3 new buckets installed. The average cost per yard is rather high, and is due to the extensive repairs to the plant. Formerly U. S. dredge No. 5 (bucket type).	

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Algoma.*[1]	*Apache.*	*Appleton.*[1]	*Attalla.*[1]	*Autauga.*[1]
District	Milwaukee	Rock Island	Milwaukee	Montgomery, Ala	Montgomery, Ala.
Length	78 feet 6 inches over all	80 feet	90 feet over all	75 feet	75 feet.
Beam	30 feet 4 inches	30 feet	32 feet	26 feet 4 inches	26 feet 4 inches.
Depth	7 feet 2 inches	8 feet	7 feet	5 feet 6 inches	5 feet 6 inches.
Draft:					
Forward	5 feet 6 inches	3.7 feet	3 feet 8 inches	3 feet 9 inches	4 feet.
Aft	3 feet 2 inches	2½ feet	2 feet	do	3 feet 5 inches.
Displacement	258 tons	217 tons	214 tons	206 tons	206 long tons or 7,416 cubic feet.
Builder	United States	Osgood Dredge Co	Purchased by the United States in 1876.	U.S. Engineer Department.	M. A. Sweeney Ship Yard & Foundry Co.
Where built	Chicago, Ill	Lyons, Iowa		Near Lock 4, Coosa River, Ala.	Mobile, Ala.
When built	1872	1895		1902; rebuilt 1908	1902.
Time to build	Unknown			4 months	5 months.
Material of hull	Wood	Wood	Wood	Creosoted yellow pine.	Yellow pine.
Cost	$29,500				$13,440.
Finished cost with outfit	Unknown	$15,255.34	$13,000	$17,000	$13,440.
Bucket:					
Type	Dipper	Dipper	Scoop dipper	Dipper with teeth	Dipper, with teeth, bottom dump.
Capacity	Sand dipper, 2¼ cubic yards; rock dipper, 1½ cubic yards.	2½ yards	1 earth 2½ cubic yards; 1 rock 1.13 cubic yards; 1 rock 1.31 cubic yards.	1¼ cubic yards	1½ cubic yards.
Length of boom	No boom (see remarks)	34 feet	39 feet	28 feet	30 feet.
Dimensions of main hoisting engine cylinders.	12 by 14 inches	10 by 12 inches	12 inches diameter by 26 inches stroke.	2 cylinders, 8½ by 10 inches.	2 cylinders 8 by 10 inches.
Boilers:					
Number	1	1	1	1	1.
Type	Locomotive	Fire box	Locomotive fire box	Internal furnace, water back.	Locomotive.
Size	4 feet 4 inches by 14 feet 6 inches	54 inches diameter; 17 feet 4 inches length.	13 feet 10 inches by 4 feet 6 inches.	6 feet 6 inches diameter, 12 feet 6 inches long.	48 inches diameter by 14.5 feet long.
Nominal horsepower	40	75	About 86	60 horsepower	45.
Working steam pressure.	90 pounds	90	90 pounds	160 pounds	100 pounds.
Average capacity per hour	105 cubic yards	40 cubic yards loose rock	70 cubic yards ordinary material.	60 cubic yards	120 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	221,690 cubic yards	7,893	74,055 cubic yards	11,500 cubic yards sand and gravel; 500 cubic yards rock; total, 12,000 cubic yards.	25,464 cubic yards and 115 logs.

Location of dredging	Harbors on west shore of Lake Michigan.	Moline Pool, Moline, Ill.	34,492 cubic yards harbors on Lake Winnebago, Wis.; 39,563 cubic yards Lower Fox River, Wis.	Coosa River, Ga., to Lock 4, Ala.	Gardners Island, Mixons Bar, Hobbs Island, Silver Creek Shoals.
Number of men in crew	Single crew, 8; double crew, 15	6	6	7, including cook	9 (average).
Cost of repairs during year	$3,692.11	$82.42	$1,407.68	$232.46	$488.54.
Operating cost for year	$17,969.22 (exclusive of repairs during year).	$3,817.65	$3,545.50 (exclusive of repairs during year).	$4,633.24	$2,894.59.
Character of material dredged.	Sand, mud, clay, and stone	Rock	34,492 cubic yards clay, mud, and sand; 39,563 cubic yards rock, clay, and hardpan.	Sand and gravel, and stone broken by blasting.	Sand and gravel; some soft marl.
Average cost per cubic yard	$0.097	$0.402	$0.0668	$0.405	$0.1136+.
	Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	*Remarks.*
	The dredge has a crane swinging from a steel mast instead of a boom; the dredge cut is 30 feet in width. [1] Name changed from dredge No. 1 to dredge Algoma.	This report covers the period July 1 to Oct. 22, 1910. During remainder of working season boat was employed between Rock Island and Burlington removing sunken steamboat hull, snags, mooring mats, and dredging at harbors and landing places; cost items and yardage are not included. [1] Dredge.	Cost per cubic yard is high, due to heavy repairs charged against one season's unusual heavy work; much rockwork was done, making yardage small; dump scows were used. [1] Name changed from dredge No. 4 to dredge Appleton.	Operating cost for year includes pay rolls and subsistence. Many logs were removed during working time of which no record was made. [1] Formerly dredge No. 3.	The time taken for removing logs was so distributed through the working time, that cost for this work can not be ascertained. It is therefore included in yardage cost. [1] Formerly dredge No. 2.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Barataria.*	*Carrollton.*	*Cascade.*[1]	*Casey.*	*Champoeg.*
District	Fourth, Mississippi River	Cincinnati, Ohio	First, Portland, Oreg.	Louisville, Ky	Second, Portland, Oreg.
Length	Barge, 102 feet	80 feet	60 feet	86 feet over all; 83⅓ feet on water line.	80 feet.
Beam	Barge, 36 feet	30 feet	30 feet	28 feet	30 feet.
Depth	Barge, 6 feet 1 inch	6 feet 9 inches	5 feet	6.6 feet	5 feet.
Draft:					
Forward	3 feet (barge loaded with machine)	4 feet 6 inches	2 feet	2 feet 6 inches	2 feet 10 inches.
Aft	do	3 feet	do	do	2 feet 7 inches.
Displacement	302 tons	250 tons	90 tons	163.4 long tons	165 tons.
Builder	McMyler Co	The Bucyrus Co	U. S. Engineer Department by hired labor.	United States	Joseph Supple.
Where built	Cleveland, Ohio	Jeffersonville, Ind	Cascade Locks, Oreg	Louisville, Ky	Portland, Oreg.
When built	1908	1901	1906	1907	1904.
Time to build	7 months		3 months	3 months	3½ months.
Material of hull	Creosoted pine	Wood	Wood	Wood	Wood.
Contract cost	$15,150 for levee machine	$22,272		$15,132.13	$19,200.
Finished cost with outfit	$30,315.85, including barge and quarterboat.	Equipment transferred from old dredge.	$6,056		$20,200.
Bucket:					
Type	Hayward orange-peel, extra heavy	Dipper	Hayward standard orange-peel.	Clamshell	Dipper.
Capacity	2 cubic yards	2½ cubic yards	1 cubic yard	2 cubic yards	1 cubic yard.
Length of boom	74 feet (radius of 72 feet)	40 feet	52 feet	42 feet	40 feet.
Dimensions of main hoisting engine cylinders.	12 inches diameter; 16-inch stroke	10-inch diameter cylinder; 14-inch stroke.	10 inches diameter; 12-inch stroke.	Double cylinder 11 by 18 inches.	8 by 12 inches.
Boilers:					
Number	1	1	1	1	1.
Type	Vertical, straight tube	Fire box, tubular	Vertical	Locomotive	Locomotive.
Size	72 inches diameter; 7 feet 3 inches in length for tubes.	16 feet by 54 inches	53 inches diameter, 102 inches high, 124 2-inch tubes.	60 inches diameter	42 inches by 15 feet 4 inches.
Nominal horsepower	100	70	50	80	40.
Working steam pressure	80 pounds	110 pounds	90 pounds	100 pounds	90 pounds.
Average capacity per hour	70 cubic yards	90 cubic yards, ordinary material	59 cubic yards	200 cubic yards, ordinary material.	60 cubic yards, ordinary material.
Total amount dredged during the fiscal year ending June 30, 1911.	135,346 cubic yards	40,610 cubic yards	34,160.25 cubic yards	73,150 cubic yards	43,433 cubic yards.
Location of dredging		Kentucky River	Cascade Locks, Oreg	Louisville & Portland Canal.	Willamette River above Portland, Oreg.
Number of men in crew		9	8	5	10.
Cost of repairs during year		$437.65	$1,386.43	$787.14	$1,893.61.
Operating cost for year		$4,167.92	$3,615.72	$4,305.91	$8,489.

Character of material dredged.		Sand, gravel, and mud	Silt.	Mud and cinders.	Gravel.
Average cost per cubic yard.		$0.1026	$0.1546	$0.0738	$0.20.
			Remarks. Included in "Cost of repairs during year" is $825 for new orange-peel bucket. [1] Previously reported as dredge No. 3.	*Remarks.* Cost of dredging 4,200 cubic yards in front of city wharf was paid for by city of Louisville.	*Remarks.* The dredge was hauled out and the hull renewed and thoroughly overhauled during the year.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Cheraw.*	*Cowlitz.*	*Farquhar, Col.*	*Frankfort.*	*Frontenac.*
District	Charleston, S. C.	Second, Portland, Oreg.	Grand Rapids, Mich.	Cincinnati, Ohio.	Oswego, N. Y.
Length	150 feet.	78 feet.	76 feet.	72 feet.	76 feet.
Beam	29 feet 1 inch.	34 feet.	24 feet.	19 feet.	26 feet.
Depth	8 feet bow; 7 feet 1 inch amidship; 7 feet 3 inches stern.	5 feet 6 inches.	6 feet.	5 feet 5 inches.	6 feet 7 inches.
Draft:					
Forward	5 feet 6 inches.	2 feet 2 inches.	5 feet.	3 feet 6 inches.	3 feet when fully coaled.
Aft	6 feet.	2 feet 3 inches.		2 feet 6 inches.	3 feet.
Displacement	620 tons.	162 tons.	250 tons.	115 tons.	156 tons.
Builder	Harlan & Hollingsworth Corporation.	Cascade Construction Co.	Dodge.	Hull, U. S. Engineer Department; machinery, Marion Steam Shovel Co.	Hull by George Goble, Oswego, N. Y.; machinery by Osgood Dredge Co., Albany, N. Y.
Where built	Wilmington, Del.	Portland, Oreg.	Grand Haven, Mich.	Hull, Frankfort, Ky.; machinery, Marion, Ohio.	Hull, Oswego, N. Y.; machinery, Albany, N. Y.
When built	1906.	First built, 1895; rebuilt, 1906; remodeled 1911.	1869.	1908.	1891.
Time to build	1 year 6 months.	Unknown.	Not known.	9 months.	6 months.
Material of hull	Steel.	Wood.	Wood.	Wood.	Wood.
Contract cost	$18,000 (hull, A-frame, stays, boom, and turntable).	Unknown.		Built by hired labor and purchase of machinery for $10,193.26.	$14,650.
Finished cost with outfit	$45,500.	$4,750.	$15,500; purchased when new or nearly new.	Equipment transferred from old dredge.	20,850, including cost of 2 dump scows.
Bucket:					
Type	Dipper.	Clam shell.	Dipper.	Dipper.	Dipper.
Capacity	1¾ cubic yards.	1½ cubic yards.	2 cubic yards.	¾ cubic yard.	1½ cubic yards.
Length of boom	49 feet.	60 feet.	40 feet.	27 feet.	26 feet.
Dimensions of main hoisting engine cylinders.	16½ inches diameter; 18-inch stroke.	10 by 12 inches.	10⅝ by 12 inches.	8-inch diameter cylinder; 10-inch stroke.	8½ by 10 inches.
Number, size, and type of—					
Propelling engines		None.			
Pumping engines		One 8-inch centrifugal.			
Boilers:					
Number	2.	1.	1.	1.	1.
Type	Return tubular.	Return tubular.	Marine.	Fire box, tubular.	Locomotive.
Size	Diameter, 72 inches; length, 18 feet.	12 feet by 84 inches.	10 by 5 feet.	15 feet by 50 inches.	48 inches diameter; 15 feet long.
Nominal horsepower	150 each.	80.		40.	53.
Working steam pressure	90 pounds.	90 pounds.	80 pounds.	125 pounds.	100 pounds.
Heating surface (total)		751 square feet.			
Grate surface (total)		20 square feet.			

Average capacity per hour	90 cubic yards	75 cubic yards[1]	65 cubic yards; usually hard material	50 cubic yards; ordinary material.	50 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	98,122 cubic yards, including 356 stumps.	57,186 cubic yards	45,171 cubic yards, July 1 to Nov. 3, 1910	37,815 cubic yards	48,810 cubic yards (scow measure).
Location of dredging	Waccamaw River, S. C.	Clatskanie River, Oreg.; Lewis River, Wash.	Grand River, Mich.	Lock entrances, Kentucky River.	Great Sodus, Little Sodus, and Oswego Harbors, N. Y.
Number of men in crew	12	10	8	9	8.
Cost of repairs during year	$3,414.52	$1,702	$1,166.90	$282.26	$475.
Operating cost for year	$8,668.89[1]	$4,781 (5 months)	$7,252.69	$7,139.49	$7,422.99.
Character of material dredged.	Mud and sand, stumps and roots.	Sand, gravel, and clay	Sand, clay, gravel, bowlders, and shale	Sand, gravel, and mud	Mud, sand, silt, gravel, etc.
Average cost per cubic yard.	$0.123[2]	$0.11	$0.1605	$0.1888	$0.125.
PLANT.					
Discharge pipe		700 linear feet			NOTE.—Now being entirely rebuilt, new hull and machinery.
Diameter of discharge pipe		8 inches			
Number of pontons		None			
Revolutions per minute:					
Propelling engines		No propelling engines			
Pumping engines		260			
Type of agitator		Water jet			
Type of suction head		No special type			
Revolutions per minute, cutter head.		No cutter head			
Average boiler pressure (gauge).		85 pounds			
Kind of fuel used		Wood			
Average vacuum in suction pipe.		12 pounds			
Average gauge pressure in discharge pipe.		Not yet taken			
BARGES.					
Number of barges in use		1			
Usage		Fuel			
Displacement, light		100 tons			
Capacity of all barges		200 tons			

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Cheraw.*	*Cowlitz.*	*Farquhar, Col.*	*Frankfort.*	*Frontenac.*
	Remarks.	***Remarks.***	***Remarks.***		***Remarks.***
	Self-propelling side-wheel dredge; beam over all, 47 feet 10 inches. [1] Includes expenses of Georgetown suboffice, ordinary repairs, expenses for surveying, and expenses of obtaining and delivering coal to dredge by separate force. [2] Nothing allowed for stumps.	Early in 1911 dipper dredge No. 1 (now Cowlitz) was remodeled into a combination hydraulic pipe line and bucket dredge. No plant other than that named above has been used in connection with this dredge. During the year ending June 30, 1911, operations were confined to bucket work only. *Work done.*—Lewis River, Wash., 29,925 cubic yards; Clatskanie River, Oreg., 27,261 cubic yards. [1] Bucket work.	The cost of dredging includes handling a second time in a 3½ cubic-yard bucket, swung by a derrick with 70-foot boom, and deposited on bank about 100 feet from dredge; also all cost of repairs during fiscal year to entire outfit, dredge, derrick, tugs, etc., and cost of towing. The dredge was hauled out Nov. 21, 1910. The hull is unsafe and must be rebuilt before it is used for further dredging.		This dredge was occupied at various times during the fiscal year in preparing foundations for cribs, marine railway, etc., and the total cost of operating includes this work. The average cost per cubic yard was obtained from actual cost of operation while engaged in channel excavation.

Name	*Green River.*	*Hell Gate.*	*Hercules.*	*Kentucky.*	*Kwasind.*
District	Louisville, Ky	Philadelphia	Wilmington, N. C	Chattanooga, Tenn	Chattanooga, Tenn.
Length	112 feet	110 feet	100 feet	100 feet	80 feet.
Beam	31 feet	35 feet	38 feet	34 feet	28 feet.
Depth	4 feet	12 feet	11 feet 4 inches	6 feet 10 inches	6 feet 6 inches.
Draft:					
Forward	33 inches	6 feet	5 feet	4 feet	3 feet 3 inches.
Aft	do	do	7 feet	3.5 feet	3 feet.
Displacement	268 long tons	720 tons	670 tons	326 tons	187 tons.
Builder	United States	Packard	Theo. Smith & Sons Co	The Bucyrus Co.[1]	Osgood Dredge Co.
Where built	Rebuilt, Spottsville, Ky	New York, N. Y	Jersey City, N. J	Paducah, Ky.[1]	Knoxville, Tenn.
When built	1896 (hull repaired 1908)	1869	1907	1900 [1]	1899.[1]
Time to build	Not recorded		About 6 months	Unknown [2]	6 months.
Material of hull	Wood	Wood	Wood	Wood	Wood.
Contract cost	$4,093.69 [1]	$25,000	$61,350	$34,300	$11,000.
Finished cost with outfit	Not recorded		$64,546.04	$34,300	$11,000.
Bucket:					
Type	Dipper	Clam shell	Clam shell	Dipper	Dipper.
Capacity	1¼ cubic yards	6 cubic yards	7 cubic yards	2 and 4 yards	1½ cubic yards.
Length of boom	50 feet	50 feet	55 feet	45 feet	38 feet.
Dimensions of main hoisting-engine cylinders.	8 by 12 inches	18½ by 24 inches	18 and 24 inches	12 by 16 inches	9 by 10 inches.
Boilers:					
Number	1	1	1	1	1.
Type	Locomotive	Marine leg	Locomotive type	Locomotive	Locomotive.
Size	4 by 14 feet	Width 8 feet, length 14 feet.	Length 22 feet 10½ inches, width of fire box 7 feet.	66 inches by 20 feet	42 inches diameter, 15 feet long.
Nominal horsepower	61	60	About 160	100	40.
Working steam pressure	150 pounds	70 pounds	Built for 125 pounds, carry about 90 pounds.	100 pounds	120 pounds.
Average capacity per hour.	50 cubic yards	100 cubic yards (ordinary material).	1,773 cubic yards	175 cubic yards	86.6 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	36,118 cubic yards	11,866 cubic yards	566,631 cubic yards, 247 stumps, 93 logs	292,800 cubic yards	40,465 cubic yards.
Location of dredging	Green and Barren Rivers, Ky.	Delaware River	River channels below Wilmington	Tennessee River below Riverton, Ala.	Tennessee River.
Number of men in crew	8	11	12	10	8.
Cost of repairs during year	$339.85	$1,549.04	No special repairs made	$1,381.91	$5,200.76.
Operating cost for year	$4,396.28	$16,033.02	Dredge, $20,566.06; tug, $13,551.12; total, $34,117.18.	$14,617.39	$5,995.66.
Character of material dredged.	Mud and leaves, sand and gravel, timber and rubble stone from old cribs and dams.	Overlying material and ledge rock.	Sand, mud, clay, and stumps	Loose gravel	Soft material, cemented gravel, hardpan and blasted rock.
Average cost per cubic yard	$0.131 per cubic yard	$1.35	For operating 6 cents, allowing nothing for the removal of logs and stumps.	$0.05	$0.1481.

[1] Rebuilt in 1908; extensive repairs in 1911.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Green River.*	*Hell Gate.*	*Hercules.*	*Kentucky.*	*Kwasind.*
	Remarks.		***Remarks.***	***Remarks.***	***Remarks.***
	Boat was in ordinary 3 months during the year. [1] Not including cost of machinery transferred from old boat.		The following is the total cost of this dredging: Operating dredge Hercules, $20,566.06; operating tug, $13,551.12; superintendence and surveys, $2,642; main office expenses, $837; part of dredge Jacksonville's expenses for rehandling 215,560 cubic yards, $8,622.42; total, $46,218.60; making the total cost 8.2 cents per cubic yard. Minor repairs were made to this plant as follows, which has been charged into the cost of operating: Minor repairs to dredge, $2,800.24; minor repairs to scows and small boats, $1,065.25; minor repairs to tug, $1,518.08; total, $5,383.57.	**[1] Rebuilt by the United States at Muscle Shoals Canal, Ala., in 1908. [2] Nine months required for rebuilding.**	Capacity per hour: Gravel or soft material, 135 cubic yards; cemented gravel and hardpan, 45 cubic yards; blasted rock, shot well, 80 cubic yards. [1] Rebuilt in 1908; extensive repairs in 1911.

Name	Louisville.	Malta.	Maumee.	Ohio.	Omro.[1]
District	Louisville, Ky.	Cincinnati, Ohio	Cleveland, Ohio	Cincinnati, Ohio (first)	Milwaukee.
Length	67 feet over all, 64 feet on water line, 61 feet at bottom.	70 feet	100 feet	110 feet	100 feet over all.
Beam	28 feet	31 feet 4 inches	36.2 feet	31 feet 6 inches	30 feet.
Depth	6 feet	6 feet 10 inches	11 feet	6 feet 8 inches	6 feet.
Draft:					
Forward	2 feet 4 inches	3 feet 6 inches	7.67 feet [1]	2 feet 11 inches	1 foot 8 inches.
Aft	do	3 feet	2.84 feet [1]	do	2 feet 1 inch.
Displacement	127.6 long tons	160 tons	549 tons	270 tons	150 tons.
Builder	Burnet & Co.	The Bucyrus Co.	Hull, Miller & Murphy, Cleveland, Ohio; machinery, Osgood Dredge Co., Albany, N. Y.; hull rebuilt, Toledo Shipbuilding Co., 1909.	Hull, Allen & Blaisdell; machinery built by American Dredge Co., 1873; remodeled 1880 and 1896; hull lengthened and bottom plating renewed in 1906; machinery remodeled and fitted with Bucyrus clutches, etc., 1896.	United States.
Where built	Cincinnati, Ohio	Muskingum River and Bucyrus, Ohio.	Cleveland	Hull, St. Louis, Mo.	Portage, Wis.
When built	1886	1888	1894	Original hull, wood, 1873; present hull, iron, 1880.	1878.
Time to build	4 months	7 months		About 1 year	Unknown.
Material of hull	Iron	Wood	Wood	Iron	Wood.
Contract cost	$25,000	$13,000		$21,950	
Finished cost with outfit	Not recorded	$17,000		About $35,000	$5,500.
Bucket:					
Type	Dipper	Endless chain on ladder.	Osgood, scoop type	Dipper	Grapple (Lancaster).
Capacity	2 cubic yards	24, 3 cubic feet each	3½ cubic yards	2.7 cubic yards	One 2½ cubic yards.
Length of boom	30 feet, crane		42.4 feet	24 feet from center [1]	60 feet.
Dimensions of main hoisting engine cylinders.	Double cylinder 12 by 14 inches.	Two 10-inch diameter, 16-inch stroke.	2 cylinders (14-inch diameter, 20-inch stroke).	12 by 15 inches	8-inch diameter by 12-inch stroke.
Boilers:					
Number	1	1	2	1	1.
Type	Locomotive	Locomotive	Locomotive	Roberts water tube	Scotch marine (Adamson furnace).
Size	54 inches diameter	17 feet 4 inches by 48 inches diameter.	19 feet by 56 inches		10 feet 8 inches by 7 feet.
Nominal horsepower	60	55	100 for 2 boilers	150	85.
Working steam pressure	100 pounds	90 to 100 pounds	70 pounds	120 pounds	110 pounds.
Average capacity per hour	90 cubic yards mud	120 cubic yards	175 cubic yards average material; 122 cubic yards, past year during actual working time, exclusive of delays, logging, etc.	250 cubic yards ordinary material.	80 cubic yards ordinary material.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Louisville.*	*Malta.*	*Maumee.*	*Ohio.*	*Omro.*
Total amount dredged during the fiscal year ending June 30, 1911.	45,860 cubic yards	91,763 cubic yards	72,680 cubic yards	109,579 cubic yards gravel, sand, rocks, etc., 230 tons large rocks, 10 tons snags.	94,820 cubic yards.
Location of dredging	Louisville & Portland Canal.	Muskingum River	Sandusky and Huron Harbors	Ohio River above Cincinnati, Ohio.	11,160 cubic yards harbors on Lake Winnebago, Wis. 83,660 cubic yards Upper Fox River, Wis.
Number of men in crew	6	9	13 men, full crew, dredge only	14	5.
Cost of repairs during year	$1,014.63	$2,053.07 [2]	Ordinary repairs, $1,692.27; additions to outfit, $3,154.10; total for dredge and tug, $4,846.37.	$2,211.22	$836.40.
Operating cost for year	$4,487.19	$11,859.59 [3]	$18,699.96	$19,890.73	$2,600 (exclusive of repairs during year).
Character of material dredged.	Mud, cinders and rock	Sand, gravel, mud, and rock.	Mud and bowlders	Gravel, sand, bowlders, cemented gravel and loose rock.	Clay, mud and sand.
Average cost per cubic yard.	$0.1298	$0.1516	$0.324 (see remarks)	$0.2026	$0.0362.
	Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	*Remarks.*
	Cost of dredging 3,475 cubic yards in front of city wharf was paid for by the city of Louisville.	[1] Taken with 31 long tons of coal in bunkers. [2] Cost of repairs: Dredge, $1,785.85; dredge tender, $267.22. [3] Operating cost: Dredge, $5,900.56; dredge tender, $5,959.03.	Dredge worked 10 working days shaping up rock on slope of east jetty at Sandusky, and 9 days removing bowlders from dock channel, Sandusky, with diver and chain, with no resultant yardage. Most of the dredging was in the dock channel at Sandusky, scraping the bed rock. The overlying material was mud interspersed with numerous large bowlders. Much time was lost in removing bowlders from the dipper, and in repairing breakdowns caused by the unusually hard character of the dredging. Lowest bid on much of the dredging done during the year was 90 cents.	The high rate of excavation was due to the employment of the dredge in removal of cemented gravel at Five Mile bar during low-water season, the material being so hard that much of it had to be blasted. [1] Length of crane.	[1] Name changed from dredge No. 5 to dredge Omro.

Name	*Oshkosh.*[1]	*Oswego.*	*Ottertail.*	*Phoenix.*	*Saginaw.*
District	Milwaukee	Cincinnati, Ohio (first)	St. Paul, Minn	Rock Island	Grand Rapids, Mich.
Length	75 feet over all	92 feet	75 feet	80 feet	83 feet 9 inches.
Beam	31 feet	31 feet 6 inches	24 feet	30 feet	28 feet (32 feet outside of spuds).
Depth	6 feet	6 feet 1 inch	6 feet	8 feet	6 feet 7 inches.
Draft:					
Forward	4 feet	3 feet 3 inches	2 feet 10 inches	3 feet 7 inches	3 feet 3 inches.
Aft	do	do	1 foot 6 inches	2 feet 6 inches	2 feet 11 inches.
Displacement	234 tons	235 tons	120 tons	186 tons	92 tons.
Builder	The Bucyrus Co., South Milwaukee, Wis.	Hull, Allen & Blaisdell[1]	Osgood Dredge Co., Albany, N. Y	A. Cutting	Carkin, Stickney & Cram.
Where built	Hull, Green Bay, Wis.; machinery, South Milwaukee, Wis.	St. Louis, Mo	Grand Forks, N. Dak	Metropolis, Ill	Not known.
When built	1905 and 1906	1883	1882	1885	Do.
Time to build	1 year 3 months	6 months	2½ months	9 months	Do.
Material of hull	Wood	Iron	Fir	Wood	Wood.
Contract cost	$39,000 (including 3 auxiliary scows).	$19,750 (hull)	Not known	$16,600	(1).
Finished cost with outfit	$39,529	$95,000	$12,600	$19,525	(1).
Bucket:					
Type	Chain bucket with teeth	Dipper	Sliding bottom	Dipper	Orange peel.
Capacity	Thirty-eight, 5 cubic feet each.	2.7 cubic yards	1½ yards	2½ cubic yards	1½ cubic yards.
Length of boom	No boom	23.75 feet from center[2]	28 feet	34 feet	70 feet.
Dimensions of main hoisting engine cylinders.	9 inches diameter by 12-inch stroke.	12 by 15 inches	8 by 16 inches	12 by 18 inches	9½ by 16 inches.
Boilers:					
Number	1	1	1	1	1.
Type	Scotch marine (Adamson furnace).	Roberts water tube	Locomotive	Fire box	Stationary tubular.
Size	10 by 9 feet		42 by 151 inches	15 feet 4 inches by 60 inches.	12 feet 6 inches by 50 inches.
Normal horsepower	140	120	40	75	
Working steam pressure	125 pounds	120 pounds	90 pounds	125 pounds	100 pounds.
Average capacity per hour	200 cubic yards ordinary digging.	250 cubic yards ordinary material.	60 cubic yards	70 cubic yards clay	
Monthly operating cost					$570.
Total amount dredged during the fiscal year ending June 30, 1911.	136,775 cubic yards (short season, 5 months).	122,967 cubic yards gravel, bowlders, and loose rock, 93.67 tons large rocks, 18.7 tons snags.	42,189 cubic yards	9,431 cubic yards rock (solid measurement) and 31,989 cubic yards loose rock, gravel, clay, etc.	(2).
Location of dredging	Upper Fox River, Wis	Ohio River above Cincinnati.	Red River of the North between Grand Forks and point 16 miles north.	Rock River pool and Moline pool.	Grand River and Grand Haven Harbor, Mich.
Number of men in crew	9	12	10	6	
Cost of repairs during year	$3,879.60 (amount includes new conveyor belting).	$2,373.71	$3,503.79	$779.63	

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Oshkosh.*	*Oswego.*	*Ottertail.*	*Phoenix.*	*Saginaw.*
Operating cost for year	$4,266.67 (exclusive of repairs during year).	$18,352.27	$2,918.09	$6,918.83	
Character of material dredged.	Clay, sand, and muck	Gravel, sand, and bowlders, with considerable quantity of cemented gravel.	Tenacious clay	Rock, gravel, and clay	
Average cost per cubic yard.	$0.0599	$0.1685	$0.1525 on total cost and $0.0694 on operating cost.	$0.127 for loose rock, gravel, and clay; $0.30 for rock (solid measurement), including towing.	
	Remarks. Elevator or chain-bucket dredge with belt conveyor for transferring spoils to 3 auxiliary scows having belt conveyors for disposing of the spoils on shore. All conveyors are operated by elec ric motors. [1] Name changed from "conveyor dredge" to dredge Oshkosh.	*Remarks.* The high rate of excavation was due to the employment of dredge in removal of cemented gravel at Five-Mile bar during low-water season, the material being so hard that much of it had to be blasted. [1] Original machinery built by Vulcan Iron Works, Oswego, N. Y.; remodeled and fitted with Bucyrus clutches in 1899. [2] Length of crane.			*Remarks.* [1] Purchased as a dipper dredge from Carkin, Stickney & Cram, of East Saginaw, Mich., in 1891, for $18,000. Rebuilt as a derrick by the United States, at Grand Haven, Mich., in 1906, at a cost of $6,571. [2] In use until November, 1910, as a derrick conveyor to assist dipper dredge. In use April-June, 1911, as an orange-peel dredge, removing old pier work at Grand Haven Harbor.

Name	*Sapelo.*[1]	*Scuppernong.*	*Umatilla.*	*Tennessee.*	*Upatoi.*[1]
District	U. S. engineer office, Savannah, Ga	Wilmington, N. C.	Portland, Oreg. (first)	Chattanooga, Tenn.	Montgomery, Ala.
Length	85 feet 4 inches	78 feet	159 feet 9 inches	100 feet	85 feet.
Beam	30 feet 8 inches	32 feet	34 feet 4 inches	34 feet	30 feet.
Depth	5 feet 5 inches top of course to bottom of planking.	7 feet	5 feet 1 inch	6 feet 10 inches	6 feet.
Draft:					
Forward	3 feet	2.8 feet	2 feet	54 inches	3 feet 9 inches.
Aft	do	do	2 feet 4 inches	38 inches	Do.
Displacement	160 tons	128 tons	300 tons	375 tons	212 tons.
Builder	United States	United States	Willamette Iron and Steel Works.	The Bucyrus Co. (machinery).	U. S. Engineer Department; hired labor.
Where built	Savannah, Ga.	Newbern	Celilo, Oreg	Muscle Shoals Canal, Ala. (hull).	Columbus, Ga.
When built	1894; rebuilt, 1901; new machining, 1907.	1904	1908	1910	1901; rebuilt, 1909.
Time to build		6 months	6 months	9 months	8 months.
Material of hull	Yellow pine	Wood	Wood	Wood	Wood treated with carbolineum.
Contract cost	$1,800	Built by United States	$55,245	$19,850 (machinery)	
Finished cost with outfit	$12,000 (present value, $6,500)	$10,299.51; $10,700 (estimate).	$60,000	$37,513	$15,717.74.
Bucket:					
Type	3-blade orange-peel Hayward (new); 4-blade orange-peel (old).	Clamshell	Channel rake with 20 cast-steel fingers; about 1 cubic yard.	Dipper (2)	Dipper.
Capacity	21 cubic feet	2½ cubic yards		1½ and 2 cubic yards	2 cubic yards.
Length of beam	56 feet	42 feet 6 inches	Has A frame, handled by cable.	45 feet	35 feet.
Dimensions of main hoisting-engine cylinders.	7 by 10 inches	7 by 12 inches	Double cylinder 6½ by 10 inches.	10 by 14 inches	10½ inches diameter, 12-inch stroke.
Boilers:					
Number	1	1	1	1	2.
Type	Vertical tube	Locomotive	Locomotive fire box	Locomotive	Locomotive fire box.
Size	8 feet by 48 inches	Length, 19 feet 8 inches; diameter, 5 feet 2 inches.	72 inches diameter, 26 feet long, 221 2½-inch tubes.	66 inches diameter, 20 feet long.	One 40 inches diameter by 17 feet; one 54 inches diameter by 18 feet.
Nominal horsepower	45	100	600	100	60+75=135.
Working steam pressure.	100 pounds	75 to 115 pounds	225 pounds	125 pounds	100 pounds.
Average capacity per hour	40	36 cubic yards		150 cubic yards per hour	125 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	13,500 cubic yards sand and rock, of which 9,487 was rock.	81,628 cubic yards and 1,000 piles pulled.	1,436 cubic yards of rock drilled, blasted, and raked from channel.	160,300 cubic yards	58,335 cubic yards.
Location of dredging	Oconee River, vicinity of Dublin, Ga.	New River to Swansboro, and Neuse and Trent Rivers.	Columbia River above Celilo, Oreg.	Tennessee River	Chattahoochee River, between Columbus, Ga., and Eufaula, Ala.; Flint River, between Bainbridge and mouth.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Sapelo.*	*Scuppernong.*	*Umatilla.*	*Tennessee.*	*Upatoi.*[1]
Number of men in crew	10	11	16	10	10.
Cost of repairs during year	$400	$1,145.42	$100	$1,550	$899.42.
Operating cost for year	$12,000	$11,962.57	$21,000	$22,687.38, including expense of towboat.	$7,000.84.
Character of material dredged.	Argillaceous sandstone and sand and clay.	Mud, sand, hardpan, and rock.	Solid rock, shattered by blasting.	Cemented gravel, loose and solid rock.	Sand, gravel, marl, and rock.
Average cost per cubic yard.	$0.50 for sand and clay; $0.90 for rock.	15.8 cents	$10 (solid rock in place)	$0.14	13.5 cents.
	Remarks. [1] Combination steam hoister and bucket dredge (not self-propelling).	*Remarks.* [1] Previously reported as a dipper and bucket dredge.	*Remarks.* The dredge was engaged in raking gravel bars, towing scows, etc., in addition to blasting and dredging rock. [1] Self-propelling rake dredge; previously reported as a dipper and bucket dredge.		*Remarks.* [1] Formerly dredge No. 1 (dipper type).

Name	*Vulcan.*	*Wabash.*	*Wallowa.*	*Wolf.*	*Wolfe, L. C.*
District	Rock Island	Louisville, Ky	Portland, Oreg. (first)	Mississippi River Commission (first and second districts).	Wheeling, W. Va.
Length	80 feet	81 feet over all, 78½ feet on water line, 74½ feet at bottom.	125 feet	80 feet	60 feet 6 inches.
Beam	30 feet	26 feet	25 feet 6 inches	28 feet	32 feet 6 inches.
Depth	8 feet	6 feet	5 feet	4 feet 6 inches	4 feet 7 inches.
Draft:					
Forward	4 feet	2 feet 5 inches	2 feet 6 inches	3 feet 6 inches	2 feet 2½ inches.
Aft	3 feet 2½ inches	2 feet 2 inches	3 feet	1 foot 8 inches	1 foot 10½ inches.
Displacement	240 tons	126 long tons	175 tons	73 tons	114 tons.
Builder	Osgood Dredge Co	Rebuilt by United States	Hull and house, Joseph Supple; propelling machinery, Columbia Engineering Works; dredging machine, Featherstone Foundry & Machinery Co.		Unknown.
Where built	Davenport, Iowa	Louisville & Portland Canal, Louisville, Ky.	Riparia, Wash	Madison, Ind	Pittsburgh, Pa.
When built	1883	Rebuilt 1900	1904	1897	Unknown.
Time to build	9 months	Not recorded	8 months		Do.
Material of hull	Wood	Wood	Wood	Wood	Wood.
Contract cost		$7,527 (for rebuilding)	$32,755	$8,000	Unknown.
Finished cost with outfit	$19,450	Not recorded	$32,755		Secondhand, $4,000.
Bucket:					
Type	Dipper	Dipper	Dipper	Dipper	Orange peel or clamshell.
Capacity	2½ cubic yards	1½ cubic yards	1 cubic yard	1 yard	1 cubic yard.
Length of boom	34 feet	30-foot crane	34 feet	40 feet	70 feet.
Dimensions of main hoisting-engine cylinders.	12 by 18 inches	Double cylinder 8½ by 12 inches.	7 by 12 inches	9½ by 10 inches	9 by 12 inches.
Boilers:					
Number	1	1	1	1	1.
Type	Fire box	Locomotive	Locomotive fire box	Fire box, locomotive	Vertical, submerged tube sheet.
Size	60 inches by 16 feet 10 inches	54 inches diameter	20 feet long, 66 inches diameter, 182 2½-inch tubes.	16 feet by 44 inches; 48 3-inch flues.	48 by 11 inches in height.
Nominal horsepower	75	60	300	40	50.
Working steam pressure.	106 pounds	80 pounds	225 pounds	100 pounds	100 pounds.
Average capacity per hour	100 cubic yards sand	50 cubic yards (ordinary material).	50 cubic yards	40 cubic yards	48 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	21,610 cubic yards	Not used as a dredge during year.	Dipper dredge not used during fiscal year.	12,100 cubic yards	Worked filling cofferdams and handling sand and gravel for concrete.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Vulcan.*	*Wabash.*	*Wallowa.*	*Wolf.*	*Wolf, L. C.*
Location of dredging	Moline Pool, Moline, Ill	Not dredging	Snake River	Wolf River, Memphis, Tenn.	Dam No. 26, Ohio River.
Number of men in crew	6		16	6 (does not include crew of tender).	3.
Cost of repairs during year	$539.48	$29.47	$175	$3,048.17	$1,722.17.
Operating cost for year	$8,111.54		$19,000	$21,780[1]	$3,130.21.
Character of material dredged.	Rock		Rock, broken by blasting	River sand	
Average cost per cubic yard.	$0.375 per cubic yard, solid measurement.		$5 (solid rock in place)	$0.184	
	Remarks.		*Remarks.*	*Remarks.*	*Remarks.*
	Dredging in Moline Pool, Moline, Ill., July 1 to Nov. 16, 1910; Apr. 10 to June 30, 1911.		Dipper dredge not used during fiscal year, but 3,441 cubic yards solid rock blasted.	Only dredged about 30 days. A small steamer was in attendance at all times to remove the dump scows. [1] Includes cost of tender.	This boat did no dredging to speak of. Has been employed filling cofferdams and handling sand and gravel from barges for concrete.

Name	*Derrick A.*[1]	*Dredge No. 1.*	*No. 1.*	*No. 1 D. B.*	*Dredge No. 1.*
District	Charleston, S. C.	Charleston, S. C.	Chicago, Ill.	Galveston, Tex.	Nashville.
Length	80 feet.	87 feet.	79 feet 10 inches.	65 feet.	80 feet.
Beam	28 feet.	30 feet 8 inches.	30 feet.	27 feet.	30 feet.
Depth	4 feet.	9 feet forward, 8½ feet aft.	7 feet 4 inches.	5 feet 6 inches.	7 feet.
Draft:					
Forward	21 inches.	6 feet.	4 feet.	2 feet 6 inches.	2 feet 6 inches.
Aft	23 inches.	5 feet.	2 feet.	2 feet 8 inches.	3 feet 11 inches.
Displacement	110 tons.	375 tons.	187 tons.	115.34 tons.	235 tons.
Builder	U. S. Engineer Department.	Unknown; rebuilt in 1892.	Vulcan Iron Works, Chicago, Ill.	John Bludworth, Galveston, Tex.	Featherstone Foundry & Machine Co., Chicago, Ill.
Where built	Granby Lock, Congaree River, S. C.	Georgetown, S. C.	Beardstown, Ill.	Galveston, Tex.	Jeffersonville, Ind.
When built	1907.	Rebuilt in 1892.	1879.	1908.	1903.
Time to build	About 4 months.	Time to rebuild, 12 months.	Not known.	3 months.	8 months.
Material of hull	Wood.	Wood.	Wood.	Wood.	Wood.
Contract cost		$4,000 (hull).	Not known.	$2,250 (hull).	$18,650.
Finished cost with outfit	$6,000 (except bucket).	$18,000.	$15,000.	$8,800.	$18,950.
Bucket:					
Type	Hayward orange peel and a clamshell.	Dipper.	Bottom dump.	Hayward clamshell, type E.	Dipper.
Capacity	1¼ cubic yards and ¾ cubic yard.	1¾ cubic yards.	Original, 1¼ cubic yards; present, 2 cubic yards.	1½ yards.	1½ cubic yards.
Length of boom	45 feet.	53 feet.	34 feet (each has a crane).	43 feet.	45 feet.
Dimensions of main hoisting-engine cylinders.	10 by 13 inches.	12-inch diameter, 20-inch stroke.	12-inch diameter, 14-inch stroke.	10 by 12 inches.	8-inch bore, 12-inch stroke.
Boilers:					
Number	1.	1.	1.	1.	1.
Type	Upright tubular.	Underfired return tube.	Locomotive.	Upright.	Locomotive.
Size	4 feet diameter, 8 feet 6 inches high.	Length, 10 feet 2 inches; diameter, 7 feet 6 inches.	54 inches by 19 feet.	53 by 102 inches.	42 inches by 12 feet 6 inches.
Nominal horsepower		150.	125.	50.	40.
Working steam pressure.	100 pounds.	80.	90 pounds.	100 pounds.	100 pounds.
Average capacity per hour.	About 25 cubic yards with 1¼ bucket.	90 cubic yards when last operated.	100 cubic yards.	60 cubic yards.	75 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	3,180 cubic yards (at work about 2 months, with much time lost).	Was not operated.	None.	50,575 cubic yards; 3,451 snags.	14,470 cubic yards.
Location of dredging	Congaree River, S. C.			Guadalupe River (dredging and snagging).	Locks 6 and 7, Cumberland River, backing dams.
Number of men in crew	10.		5.	15.	5 on dredge, 4 on tender.
Cost of repairs during year.	$20.93 (3½ months).		$300.	$2,095.74.	$250.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Derrick A.*	*Dredge No. 1.*	*No. 1.*	*No. 1 D. B.*	*Dredge No. 1.*
Operating cost for year	Field, $1,464.85; field office, $2,084.72 (3½ months each).			$17,068.95	About $460 (1 month).
Character of material dredged.	Sand			Sand and gravel	Sand and gravel.
Average cost per cubic yard	Field, $0.2764; total, $0.3938			$0.1698	$0.07.
Average cost per snag				$0.2457	
	Remarks.	***Remarks.***	***Remarks.***	***Remarks.***	***Remarks.***
	Derrick A had to move by lines, and lost much time also on account of high water. Snagging, about 1¼ months, including moving and delays; removed 351 snags. [1] Bucket dredge; carries 6-inch sand pump and does some snagging.	This dredge is laid up at Smithville, S. C. Condition poor; unserviceable.	The operating cost includes labor, supplies, and all repairs to dredge tenders and scows during the working season and all repairs to dredge during the year, but not the repairs to tenders, scows, quarter boats, barges, etc., during the closed season. With the latter added the cost would be between 14 and 15 cents per cubic yard.	This is a combination bucket dredge and snagboat.	The dredge was only used in backing up Dams 6 and 7 and the rest of the year was laid up. The cost of repairs was principally for hoisting rope.

Name	*Dredge No. 1.*	*Dredge No. 2.*	*Dredge No. 3.*	*No. 2, U. S. E D. Wheeling.*	*No. 19, clamshell derrick boat.*
District	Pittsburgh, Pa	Chicago, Ill	Pittsburgh, Pa	Wheeling, W. Va	Mobile, Ala.
Length	85 feet	79 feet 10 inches	86 feet 6 inches	70 feet 6 inches	75 feet 9 inches.
Beam	32 feet	30 feet	30 feet	32 feet	25 feet 1 inch.
Depth	6 feet 2 inches (molded)	7 feet 4 inches	4 feet 8 inches	4 feet	6 feet 8 inches.
Draft:					
Forward	4 feet 6 inches	4 feet 4 inches	3 feet 2 inches	1 foot 10 inches	2 feet 8 inches.
Aft	3 feet 6 inches	2 feet 2 inches	2 feet 6 inches	2 feet 2 inches	2 feet 4 inches.
Displacement	295 tons	195 tons	197 tons	130 tons	98.9 long tons.
Builder	The M. A. Sweeney Shipyard & Foundry Co.	Vulcan Iron Works, Chicago, Ill.	Bought from the Evansville Contract Co., second hand.	Unknown	T. C. Spencer.
Where built	Jeffersonville, Ind	Beardstown, Ill	Parkersburg, W. Va	Pittsburgh, Pa	Moss Point, Miss.
When built	1903	1882	1906	Unknown	1906.
Time to build	6 months	Not known	Not known	do	Not known.
Material of hull	Wood	Wood	Wood	Wood	Wood.
Contract cost	Contract was for $19,740	Not known	$17,000 (second hand)	Unknown	$2,050 purchase price of hull.
Finished cost with outfit	$17,565	$15,500 (purchased by the United States in 1908).	$21,600	$3,200 (second hand)	$4,500.
Bucket:					
Type	Dipper	Bottom dump	Dipper	Clamshell or orange peel	Clamshell.
Capacity	2.3 and 3 yards	Original, 1½ cubic yards; present, 2 cubic yards.	1.75 and 2.25 yards	1 cubic yard	1 yard.
Length of boom	40 feet	34 feet	35 feet	65 feet	45 feet.
Dimensions of main hoisting-engine cylinder.	11 inches diameter, 14-inch stroke	12 inches diameter, 14-inch stroke.	10 inches diameter, 14-inch stroke.	10 by 12 inches	8½ by 10 inches.
Boilers:					
Number	2	1	2	1	1.
Type	1 locomotive; 1 vertical	Locomotive	1 locomotive; 1 vertical	Return tubular Economic	Fire tubular.
Size—					
Locomotive	Length (over all), 18 feet; diameter, 54 inches.	54 inches by 19 feet	Length (over all), 18 feet; diameter, 54 inches.	60 inches in diameter; 13½ feet in length.	43 inches diameter by 95 inches high.
Vertical	Height, 6 feet; diameter, 30 inches.		Height, 7 feet; diameter, 38 inches.		
Nominal horsepower—					
Locomotive	60	125	60	90	30.
Vertical	10		15		
Working steam pressure.	110 pounds	90 pounds	100 pounds	100 pounds	125 pounds.
Average capacity per hour.	Average conditions, 100 cubic yards; good conditions, 200 cubic yards.	100 cubic yards	Average conditions, 67 cubic yards; good conditions, 134 cubic yards.	48 cubic yards	40 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	84,850 cubic yards	97,746 cubic yards	115,614 cubic yards	Filled cofferdams and handling sand and gravel for concrete.	700 yards mud and 1,000 yards of rock.

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*Dredge No. 1.*	*Dredge No. 2.*	*Dredge No. 2.*	*No. 2, U. S. E D. Wheeling.*	*No. 19, clamshell derrick boat.*
Location of dredging	Monongahela River	Illinois and Mississippi Rivers.	Monongahela, Ohio, and Allegheny Rivers.	Dam No. 26, Ohio River	Lock No. 1, Tombigbee River. Lower approach, lock chamber, and dredging out old cribs.
Number of men in crew:					
Dredgeboat	9	5	9	2	5 to 8 men.
Tender	14		9		
Cost of repairs during year:					
Dredgeboat	$885.99	$500	$1,287.03	$790.28	$70.
Tender	$569.89		$1,347.43		
Operating cost for year:					
Dredgeboat	$12,031.58	$11,301	$13,009.35	$2,422.16	$400.65.
Tender	$16,790.27		$13,143.05		
Total	$28,821.85[1]		$26,152.40[1]		
Character of material dredged.		Sand and blue clay			Mud and rock.
Average cost per cubic yard					
For 12 months	$0.339+	$0.115	$0.226+		$0.24.
For 10 months	$0.283+		$0.1885+		
	Remarks.	*Remarks.*	*Remarks.*	*Remarks.*	*Remarks.*
	The above cost per cubic yard for 10 months only is for the months in which portions, at least, of the materials dredged were measurable. During two full months and part of time in some other months the dredges were employed tearing out and removing old dams, abutments, and wrecks. [1] Ordinary excavation, crib foundations, filling and removal of cofferdams, etc.	The operating cost includes labor, supplies, and all repairs to dredge, tenders, and scows during the working season and all repairs to dredge during the year, but not the repairs to tenders, scows, quarterboats, barges, etc., during the closed season. With the latter added the cost would be between 14 and 15 cents per cubic yard.	The above cost per cubic yard for 10 months only is for the months in which portions, at least, of the materials dredged were measurable. During two full months and part of time in some other months the dredges were employed tearing out and removing old locks, dams, abutments, and wrecks. [1] Ordinary excavation, crib foundations, filling and removal of cofferdams, etc.	Did no dredging during the past year. Has been employed filling cofferdams and handling sand and gravel from barges for concrete.	This plant was assembled principally from material on hand, and with a view of removing derrick whenever required for other purposes. Hull is somewhat decayed above water line.

Name	*No. 24, U. S. E. D. Wheeling.*	*Dredge No. 68.*	*Bank derrick No. 1.*	*Bank derrick No. 2.*
District	Wheeling, W. Va.	Little Rock, Ark.	Charleston, S. C.	Charleston, S. C.
Length	75 feet.	100 feet.	33 feet (derrick on 50,000 pounds).	33 feet (derrick on 50,000 pounds).
Beam	35 feet.	34 feet.	8½ feet (capacity flat car).	8½ feet (capacity flat car).
Depth	4 feet 10 inches.	6 feet.		
Draft:				
Forward	1.8 feet.	3 feet.		
Aft	2.7 feet.	1 foot 6 inches.		
Displacement	161 tons.	200 tons.		
Builder	U. S. Engineer Department by hired labor.	Bucyrus Co. and United States Engineers.	U. S. Engineer Department.	U. S. Engineer Department.
Where built	Hogsett, W. Va.	Batesville, Ark.	Georgetown, S. C.	Georgetown, S. C.
When built	1910.	1904.	1910.	1910
Time to build	4 months.	3½ months.	3 months.	3 months.
Material of hull	Wood.	Wood.	Wood.	Wood.
Contract cost	$7,437.45.	$14,413.		
Finished cost with outfit	$7,655.06 (does not include cost of machinery; machinery used was hoisting engine and boiler taken from stationary plant).	About $16,000.	$4,486.95 (includes cost of rail, crossties, etc., for track).	$2,786.90 (includes cost of rail, crossties, etc., for track).
Bucket:				
Type	Orange-peel or clamshell.	Dipper.	Grab with teeth.	Orange-peel.
Capacity	1 cubic yard.	1 cubic yard level full.	1 cubic yard and 1½ cubic yards.	¾ cubic yard.
Length of boom	65 feet.	50 feet.	45 feet.	45 feet.
Dimensions of main hoisting engine cylinders.	10 by 12 inches.	9 by 12 inches.	8 by 12 inches.	8½ by 10 inches.
Boilers:				
Number	1.	1.	1.	1.
Type	Return tubular Economic.	Locomotive.	Plain flue vertical.	Plain flue vertical.
Size	50 inches diameter; 13½ feet over all.	48-inch barrel; length over all, 18 feet.	Diameter, 46 inches; height, 102 inches.	Diameter, 40 inches; height, 104 inches.
Nominal horsepower	60.	30; 440 square feet heating surface	50.	25.
Working steam pressure	100 pounds.	90 pounds.	125 pounds.	100 pounds.
Average capacity per hour	50 cubic yards.	45 cubic yards.	40 cubic yards.	35 cubic yards.
Total amount dredged during the fiscal year ending June 30, 1911.	Worked filling cofferdams and handling sand and gravel for concrete.	6,470 linear feet (does not include work of rebacking dams nor clearing lock pits).	27,004 cubic yards.	23,546 cubic yards.
Location of dredging	Dam No. 26, Ohio River.	Pools Nos. 1 and 2, upper White River, Ark.	Waccamaw River, N. C. and S. C.	Waccamaw River, S. C.
Number of men in crew	3.	7.	3 (assisted by separate force in shifting track and moving, and clearing right of way).	3 (assisted by separate force in shifting track and moving, and clearing right of way).

TABLE III.—*Report of operations of dipper and bucket dredges for the fiscal year ending June 30, 1911*—Continued.

Name	*No. 24, U. S. E. D. Wheeling.*	*Dredge No. 68.*	*Bank derrick No. 1.*	*Bank derrick No. 2.*
Cost of repairs during year	$238.35 (since Jan. 1, 1911)	$1,015.30	See remarks	See remarks.
Operating cost for year	$680.46 (since Jan. 1, 1911)	$1,731.49	$3,355.30 [1]	$3.021.62.[1]
Character of material dredged		Gravel	Spoil banks of sand, mud, loose stumps, and logs.	Spoil banks of sand, mud, loose stumps, and logs.
Average cost per cubic yard		No record kept of yardage	12.4 cents	12.8 cents.
	Remarks. This boat did little work dredging. Has been employed filling cofferdams and handling sand and gravel from barges for concrete.	*Remarks.* 1,911 linear feet of dredging reduced to equivalent of a single cut 35 feet wide and 4 feet deep. [1] In commission 86 days.	*Remarks.* Ordinary repairs are not separated from operating cost. [1] Includes expenses of Georgetown suboffice, surveying, and obtaining and delivering coal.	*Remarks.* Ordinary repairs are not separated from operating cost. [1] Includes expenses of Georgetown suboffice, surveying, and obtaining and delivering coal.

TABLE IV.—*Report of operations of snag boats for fiscal year ending June 30, 1911.*

Name	*Arkansas.*	*Black Warrior.*	*Chattahoochee.*	*Choctawhatchee.*	*Columbia.*
District	Little Rock	Mobile	Montgomery, Ala	Montgomery, Ala	Vicksburg, Miss.
Length	140 feet	136 feet 6 inches	140 feet	90 feet	121 feet.
Beam	30 feet	33 feet 2 inches	29 feet	24 feet	26 feet.
Depth	4 feet 6 inches	4 feet 4½ inches	4 feet	3 feet 6 inches	3 feet 3 inches.
Draft:					
Forward	2 feet 1 inch	2 feet 1 inch	30 inches	22 inches	18 inches.
Aft	2 feet 6 inches	3 feet 3 inches	do	24 inches	30 inches.
Displacement	285 tons	305 tons	233 long tons (8,388 cubic feet).	115 tons (4,140 cubic feet)	136.87 long tons.
Builder	M. A. Sweeney Shipyard & Foundry Co.	Jas. Flock	U. S. Engineer Department; hired labor.	U. S. Engineer Department.	Not known.
Where built	Jeffersonville, Ind	Mobile, Ala	Burdocks Landing, Chattahoochee River.	Pine Barren, Fla	Gainesville, Miss.
When built	1900	Between 1889 and 1891	1896	1902–3	1877.
Time to build	1 year				
Material of hull	Steel	Wood	Wood	Yellow pine	Wood.
Contract cost	$32,899 (including outfit) [1]	$28,000	First cost, $12,000		
Finished cost, with outfit				$5,400	Do.
Cost to United States when purchased.					$1,800.
Bucket:					
Type	None	Originally had a dipper bucket.	None		
Capacity		1¼ yards	do		
Length of boom	None	Now 40 feet	25 feet		
Capacity of boom	do	30 tons	1 ton		
Capacity of machine per hour while bucket dredging.	do	Dredging apparatus has been removed.	None		
"A" frame (steel):					
Height	36 feet				
Width at foot	20 feet center to center				
Width at top	3 feet 4 inches out to out				
Dimensions of legs	Phoenix column, inside diameter, $7\frac{1}{16}$ inches; outside diameter, $8\frac{1}{16}$ inches.				
Dimensions of main hoisting-engine cylinders.	8 by 8 inches	1 capstan, 2 engines, 6 by 6 inches.	2 capstan engines, double cylinders, 8 inches diameter, 12 inches stroke.	7 by 12 inches, double	8 inches diameter, 14 inches stroke.
Dimensions of propelling engines.	10 inches by 4 feet 6 inches	16 by 72 inches	15 inches diameter, 4 feet stroke.	9 by 36 inches	12 inches diameter, 36 inches stroke.
Diameter of wheel	12 feet over buckets	17 feet 6 inches	18 feet	10 feet	15 feet.
Length and width of buckets	18 feet 8 inches by 18 inches wide.	18 feet by 1 foot 6 inches			15 feet long, 18 inches wide.
Revolutions per minute	26	15 (average)			22.
Speed per hour	5 miles (average)	About 7 miles			6 miles (average).

TABLE IV.—*Report of operations of snag boats for fiscal year ending June 30, 1911*—Continued.

Name	*Arkansas.*	*Black Warrior.*	*Chattahoochee.*	*Choctawhatchee.*	*Columbia.*
Boilers:					
Number	2	2			1.
Type	5-flue (Mississippi)	Western River, return-flue			Mississippi River, flue.
Size	40 inches by 20 feet	4 feet diameter, 28 feet long			20 feet long, 48 inches diameter.
Heating surface (total)	746 square feet	1,243 square feet			458 square feet.
Grate surface (total)	32 square feet	45 square feet			28 square feet.
Working steam pressure	169 pounds	90 pounds			140 pounds.
Cost of repairs during year	$1,262.59	$45.70			$1,375.12.
Fuel cost per year	$1,281.81	$284.63			$741.78.
Operating cost per year [1]	$14,348.40 [2]	July to December, 1910, inclusive, $5,908.10.			$7,700.94.
Work done during year	Removed 2,089 snags, broke up 5 drifts, cut 6,730 trees, and girdled 317 trees; 2,283 miles run.	1,357 obstructions removed			Snags removed, 305; stumps removed, 13; leaning trees cut, 9; and miscellaneous towing of quarter-boats, barges, etc. Boat was used from Sept. 13, 1910, to Mar. 27, 1911, for quarters and transportation of survey parties on Mississippi, Yazoo, and Ouachita Rivers.
Average cost per snag	Indefinite	$4.35			$2.46.
Average cost per yard of dredged material.	None				
	Remarks. [1] Although contract price was $32,899, the deductions on account of delay in completion reduced the cost to $27,138.87. [2] In commission 281 days.	*Remarks.* In addition to the above, 480 feet of jetty was built, and 1 month spent on repairs of dam.			

Name	*Conecuh.*	*Culberson, C. A.*	*Delatour.*	*Demopolis.*	*Escambia.*
District	Montgomery, Ala.	Dallas, Tex.	New Orleans, La.	Mobile	Montgomery, Ala.
Length	60 feet	106 feet	112 feet; over all 162 feet 2 inches.	82 feet 3 inches	92 feet.
Beam	20 feet	28 feet	30 feet	25 feet 6 inches	25 feet.
Depth	3 feet	5 feet	5 feet	4 feet 9 inches	4 feet.
Draft:					
Forward		2 feet 2 inches	3 feet 7 inches	1 foot 10 inches	20 inches.
Aft		3 feet 4 inches	do.	1 foot 11 inches	22 inches.
Displacement	37 long tons	200 tons	Drafts: Forward, 3 feet 7 inches; aft, 3 feet 7 inches; length on water line, etc., 109 feet.	96 tons	112 tons (4,032 cubic feet).
Builder	U. S. Engineer Department.	M. A. Sweeney Shipyard & Foundry Co.	M. A. Sweeney Shipyard & Foundry Co.	William Foster	U. S. Engineer Department.
Where built	River Falls, Ala.	Jeffersonville, Ind.	Jeffersonville, Ind.	Mobile, Ala.	Pine Barren, Fla.
When built	1907	1908	1908-9	1891	1909.
Time to build	6 months	26 months	18 months		7 months.
Material of hull	Yellow pine	Wood	Wood	Wood	Long leaf yellow pine.
Contract cost		$21,840	$39,812.45	$4,067	$5,093.44.
Finished cost with outfit	$1,250		$40,812.45		$5,350.95.
Bucket:					
Type		None		None	
Capacity					
Length of boom		39½ feet	50 feet	41 feet	
Capacity of boom		25 tons		30 tons	
Capacity of machine per hour while bucket dredging.				None	
Dimensions of main hoisting engine cylinders.		7 by 14 inches	10 by 14 inches	2 capstan engines, 6 by 6 inches.	6 by 7 inches (double).
Dimensions of propelling-engine cylinders.		5 feet by 12 inches	12 by 48 inches	Nonpropelling	9 by 36 inches (double).
Diameter of wheel		15 feet	14 feet by 10 inches		12 feet.
Length and width of buckets.		1½ by 18 feet	14 feet 9 inches by 1 foot 6 inches.		
Revolutions per minute		12	18	do	
Speed in miles per hour		12 (approximate)	7 miles	do	
Boilers:					
Number		3	2	1	
Type		2 horizontal, 1 upright	Flue type	Vertical tubular	
Size		Two 16 feet by 44 inches One 3 feet by 7 feet	40 inches by 20 feet	13 horsepower	
Heating surface (total)		740 square feet		166 square feet	
Grate surface (total)		36 square feet		96 11/16 square feet	
Working steam pressure.		160 pounds		90 pounds	

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Conecuh.*	*Culberson, C. A.*	*Delatour.*	*Demopolis.*	*Escambia.*
Cost of repairs during year		$75	$442.97	$9,090.02	
Fuel cost per year		Wood for fuel cut from banks by crew.	$2,871.65	$198.07	
Operating cost per year		$9,648.18	$18,461.55	$9,487.99	
Work done during year		Removed 1,535 snags	See remarks	3,240 obstructions removed	
Average cost per snag		$6.22	Impracticable to give this, as this is a combined dredge and snag boat, and cost of operation covers both dredging and snagging.	$2.93	
Average cost per yard of dredged material					
	Remarks. Hand-power snag boat; formerly barge No. 22.		*Remarks.* Snagging 100 hours 25 minutes. Removed 133 snags, logs, piling, fallen and overhanging trees; 2 wrecks of old barges, and 1 steamboat wheel. Combined dredge and snag boat.		

Name	*Escatawpa.*	*Flint.*	*Florence, Thos. B.*	*Great Pee Dee.*	*Guadalupe.*
District	Mobile, Ala.	Montgomery, Ala.	Vicksburg, Miss.	Charleston, S. C.	Galveston, Tex.
Length	60 feet.	96 feet.	96 feet.	100 feet.	118 feet.
Beam	20 feet.	24 feet.	20 feet.	25 feet.	28 feet.
Depth	4 feet.	4 feet.	4 feet.	5 feet 6 inches.	5 feet 11 inches.
Draft:					
Forward	1 foot 10 inches.	30 inches.	23 inches.	About 2 feet 6 inches.	3 feet 8 inches.
Aft	2 feet.	do.	31 inches.	About 3 feet 6 inches.	3 feet 4 inches.
Displacement	62 tons.	127 long tons (4,574 cubic feet).	107 long tons.	188 tons.	227 tons.
Builder	U. S. Engineer Department.	U. S. Engineer Department.	Allen & Blaisdell.	Rebuilt by U. S. Engineer Department.	U. S. Engineer Department.
Where built	Hattiesburg, Miss.	Burdocks Landing, Ala.	South St. Louis, Mo.	Rebuilt at Georgetown, S. C.	Victoria, Tex.
When built	1910.	1893–94.	1875.	Rebuilt in 1906.	1908.
Time to build	2 months.		Not known.	Time to rebuild about 12 months.	4 months.
Material of hull	Wood.	Wood.	Iron and steel.	Wood.	Wood.
Contract cost	$3,246.90.	$4,500 (hired labor).	$14,000.		
Finished cost with outfit	$4,348.90.		Not known.	Cost of rebuilding, $4,070.	$38,077.50.
Bucket:					
Type	None.	None.		None.	Hayward Clamshell type E.
Capacity		do.			1½ cubic yards.
Length of boom	29 feet.	28 feet.		None.	2; 45 feet and 60 feet.
Capacity of boom	15 tons.	1 ton.		do.	35 tons.
Capacity of machine per hour while bucket dredging.		No bucket.			60 cubic yards.
Dimensions of main hoisting engine cylinders.	2 capstan cylinders, 6 by 6 inches.	Capstan engines, 7 by 8 inches.	No hoisting engines.	None.	10 by 12 inches.
Dimensions of propelling engine cylinders.	None.	9 by 3 foot stroke.	11$\frac{11}{16}$ inches diameter; 3½-foot stroke.	do.	12 by 48 inches.
Diameter of wheel	do.	Diameter 11 feet 9 inches by 17 feet long.	11 feet 6 inches.	do.	16 feet.
Length and width of buckets.	None.		14 feet long 12 inches wide.	None.	16 feet 18 inches.
Revolutions per minute			26.		20.
Speed per hour			12 miles.		7½ miles.
Boilers:					
Number	1.		1.	None.	2.
Type	Vertical tubular.		Horizontal tubular; four 6-inch and two 12-inch tubes.		Scotch marine.
Size	8½ by 4 feet.		22 feet long 42 inches diameter.		7 feet 6 inches by 10 inches.
Heating surface (total).	200 square feet.		40 square feet.		794 square feet.
Grate surface (total).	18 square feet.		18 square feet.		Oil fuel; no grates.
Working steam pressure.	100 pounds.		180 pounds.		150 pounds.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Escatawpa.*	*Flint.*	*Florence, Thos. B.*	*Great Pee Dee.*	*Guadalupe.*
Cost of repairs during year	$9.12		No repairs made	None	$458.02.
Fuel cost per year	None		$1,164		$1,798.44.
Operating cost per year	$1,746.05		$4,156	Not operated	$28,688.82.
Work done during year	957 obstructions removed		Miscellaneous towing for locks and dams Nos. 4 and 8, Ouachita River, Ark. and La.	None	Miscellaneous.
Average cost per snag	$1.02		No snags pulled		
	Remarks. Snagging work carried on Oct. 24 to Dec. 28, 1910.			*Remarks.* Sunk and was raised and dismantled in June, 1910. The hull is now at Smithville, S. C., sunk; it is worthless, being decayed throughout.	*Remarks.* Was used as a quarter boat part of time to pull out old piling as a derrick to handle supplies and materials on removal of old stone jetty and various minor works. No record of each particular work available.

Name	*Howell, C. W.*	*Humphreys, Ben.*	*Johnson, A. B.*	*Kentucky.*	*Macomb, J. N.*
District	Vicksburg, Miss.	Vicksburg, Miss.	Little Rock	Cincinnati, Ohio (2d)	St. Louis, Mo.
Length	146 feet	137 feet	84 feet	127 feet	177 feet 6 inches.
Beam	36 feet	32 feet	22 feet	30 feet	62 feet.
Depth	5 feet	5 feet	3 feet	5 feet 6 inches	8 feet.
Draft:					
Forward	30 inches	30 inches	12 inches	3 feet 6 inches	4 feet 9 inches.
Aft	38 inches	40 inches	do	4 feet 3 inches	Do.
Displacement	304.46 long tons	286.60 long tons	48 tons	370 tons	1,160 tons (2,240 pounds).
Builder	Allen & Blaisdell	Ed. J. Howard	U. S. Engineers	Ed. J. Howard	N. G. Thom.
Where built	South St. Louis, Mo.	Jeffersonville, Ind.	Madison, Ark	Jeffersonville, Ind.	Cincinnati, Ohio.
When built	1881	Apr. 2, 1906, to May 30, 1908.	1904	1909	1873-74.
Time to build	Not known	2 years and 2 months (about)	3½ months	7 months	22 months.
Material of hull	Iron and steel	Iron and steel	Wood	Wood	Steel.
Cost	$44,650	$42,483	$2,731 (does not include machinery from old boat).	$27,067.50 (contract)	
Finished cost with outfit	Not known	$46,113.40	$4,300 (including value of machinery from old boat).	Unknown; outfit transferred from General O. M. Poe.	$241,000
Bucket:					
Type		Orange peel	None	This boat has no machinery for dredging.	None.
Capacity		1 cubic yard	do		
Length of boom		40 feet	do		
Capacity of boom		5 tons	do		
Capacity of machine per hour while bucket dredging.		60 cubic yards	None		
A Frame (wood):					
Height			26 feet		
Width at foot			18 feet 4 inches center to center.		
Width at top			3 feet 8 inches over all		
Dimension of legs			10 inches by 10 inches		
Dimensions of main hoisting engine cylinders.	Double; 7-inch diameter, 12-inch stroke.	8½-inch diameter, 10-foot stroke.	4-inch diameter, 8-inch stroke.	7-inch diameter, 10-inch stroke; double-cylinder engine for removing snags.	7 by 16 inch double oscillating and 10 by 15 inches.
Dimension of propelling engine cylinders.	15-inch diameter, 4½-foot stroke.	12-inch diameter, 6-foot stroke.		15-inch diameter; 5-foot stroke, double engine.	22-inch by 6-foot stroke.
Diameter of wheel	16 feet	16½ feet		15 feet 8 inches	24 feet.
Length and width of buckets.	19 feet long, 16 inches wide	18 feet long, 18 inches wide		Length, 20 feet 8 inches; width, 2 feet 3 inches.	12 feet long, 22 inches wide.
Revolutions per minute	20	20		22	18.
Speed per hour	8 miles (average)	8 miles (average)		9 miles	8½ miles in still water.
Boilers:					
Number	2	2	1	3	5.
Type	Mississippi River cylindrical return flue.	Mississippi River cylindrical return flue.	Vertical	Cylindrical return flue	Mississippi River.
Size	22 feet long, 42 inches diameter.	22 feet long, 40 inches diameter.	3 feet 3 inches by 7 feet 4 inches.	38 inches diameter, 20 feet long.	42 inches by 28 feet; flues, two 9-inch diameter, two 11-inch diameter.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Howell, C. W.*	*Humphreys, Ben.*	*Johnson, A. B.*	*Kentucky.*	*Macomb, J. N.*
Boilers—Continued.					
Heating surface (total)	530 square feet	995 square feet	32 square feet	1,111 square feet	2,550 square feet.
Grate surface (total)	45 square feet	47½ square feet	7 square feet	128 square feet	96 square feet.
Working steam pressure.	175 pounds	181 pounds (limit)	90 pounds per square inch	190 pounds	160 pounds.
Cost of repairs during year	$4,080.90	$3,030.53	$1,665.87	$659.65	$3,580.13.
Fuel cost per year	$2,063.44	$940.87	$4.50[1]	$3,282.80	$7,540.58.
Operating cost per year	$14,517.76	$9,964.80	$5,189.88[2]	$18,370.07	$32,806.94.
Work done during year	Snags removed, 3,431; stumps removed, 1,804; trees cut, 354; wrecks removed, 1; and miscellaneous towing of quarter boats, barges, etc.	46,645 cubic yards material dredged and miscellaneous towing of quarter boats, barges, etc.	940 snags removed, 53 drifts broken, 1,177 trees cut, 1,107 trees girdled.	Miles run, 4,221.2; miles towed 1 barge, 7,678; snags removed, 1,046.	2,263 snags pulled, 734 trees cut, 4 drift piles removed, 12 wrecks destroyed.
Average cost per snag	$2.60	No snags pulled	Indeterminate	$2.92	$17.70.
Average cost per cubic yard of material dredged.		$0.16	None	No dredging performed	
			Remarks. [1] Obtained fuel free, by use of wood from trees cut. [2] In commission 200 days.	*Remarks.* This boat is a combination snag and tow boat; the boat was engaged in snagging about 60 days, and the remainder of the time in towing dredges and barges and assisting in repair work.	

Name	*Mammoth Cave.*	*Mandan.*	*Mathloma.*	*R. C. McCalla.*	*James B. McPherson.*
District	Louisville, Ky	Kansas City, Mo	Portland, Oreg. (second)	Mobile	Kansas City, Mo.
Length	120 feet	138 feet	140 feet	100 feet	170 feet.
Beam	30 feet	24 feet	34 feet	28 feet	36 feet.
Depth	5 feet	4 feet 7 inches	4 feet	5 feet	5 feet 7 inches.
Draft:					
Forward	30 inches	26½ inches	1 foot 4 inches	1 foot 3 inches	30 inches.
Aft	38 inches	28½ inches	2 feet 4 inches	2 feet 7 inches	38 inches.
Displacement	284 long tons	150 tons	177 tons	133 tons	340 tons.
Builder	New hull, cabin, etc., Ed. J. Howard.	Carondelet Boiler & S. I. Works.	Joseph Supple	Howard Ship Yards Co	Iowa Iron Works.
Where built	Jeffersonville, Ind	St. Louis, Mo	Portland, Oreg	Jeffersonville, Ind	Dubuque, Iowa.
When built	1908	1891	First built, 1896; rebuilt, 1906.	1909	1891.
Time to build		About 5 months	2 months	Apr. 20, 1908, to Feb. 5, 1909	No record.
Material of hull	Steel	Steel	Wood	Wood	Steel.
Contract cost	Without machinery, $30,830.	$21,500	$19,560	$19,000	$45,500.
Finished cost with outfit	Not recorded	No record	$20,090		No record.
Bucket:					
Type		No dredging outfit	Page scraper	No bucket	No dredging outfit.
Capacity			1½ cubic yards		
Steel shears	28 feet high				
Length of A-frame boom		Shear legs, 31 feet long	50 feet	40 feet	Height, 34 feet.
Capacity	150 short tons	50 tons	15 tons	15 tons	100 tons.
Capacity of machine per hour while bucket dredging.	Not used for dredging		120 cubic yards	No dredging apparatus	
Dimensions of main hoisting-engine cylinders.		3 capstans; 4 cylinders 8 by 10 inches; 2 cylinders 6 by 8 inches.	10 by 12 inches	6½ inches diameter, 10-inch stroke.	3 capstans; 4 cylinders 10 by 16 inches; 2 cylinders 6 by 10 inches.
Dimensions of propelling-engine cylinders.	14 inches by 4½ feet	2 engines; high pressure, 38.48 square inches; low pressure, 147.61 square inches; 4-foot stroke.	16 by 60 inches	10 inches by 5 feet	High pressure, 16 by 72 inches; low pressure, 32 by 72 inches.
Diameter of wheel	14 feet	13 feet 8½ inches (stern wheel).	16 feet	13 feet	19 feet (stern wheel).
Length and width of buckets.	20 feet long, 20 inches wide	15 feet 4 inches by 18 inches	16 feet by 18 inches	Length 16 feet, width 16 inches.	18 feet 4 inches by 22 inches.
Revolutions per minute	18	20	28	25	16.
Speed per hour	7½ to 8 miles	3½ miles upstream; 8½ miles downstream.	10 miles	9 miles	About 5 miles upstream; 10 to 12 miles downstream.
Boilers:					
Number	3, each 11½ inches by 20 feet	2	1	2	1.
Type	Cylindrical return flue, 2 flues each boiler.	Cylindrical (5 flues each)	Locomotive	Western river, steamboat type.	Iowa. 112 flues, 3½ inches diameter.
Size	36 inches diameter by 20 feet long.	14 feet by 36 inches	56 by 16 inches	36 inches by 24 feet	12 feet by 6 feet.
Heating surface (total)		460 square feet	1,805 square feet	753.3 square feet	1,371 square feet.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Mammoth Cave.*	*Mandan.*	*Mathloma.*	*R. C. McCalla.*	*James B. McPherson.*
Boilers—Continued.					
Grate surface (total)	44 square feet	30 square feet	25 square feet	40 square feet	36 square feet.
Working steam pressure.	187 pounds	160 pounds	120 pounds	200 pounds	150 pounds.
Nominal horsepower			50 (hoisting machine)		
Cost of repairs during year	$884.29	$10,522	$1,117.01	$732.17	$240.
Fuel cost per year	$1,334.11	$1,400	Last year cost $1,513	$296.80	$1,400.
Ice and laundry	$292.38				
Operating cost per year	$12,149.45	About $15,000	$12,382	$8,147.45	About $17,000.
Location of work			Willamette River, above Portland, Oreg.		
Number of men in crew			14		
Total number of snags removed during fiscal year ended June 30, 1911.			1,428 (including 126 removed from Lewis River).		
Work done during year	Removed obstructions from Green, Barren, and Rough Rivers, Ky.; towed material for repairs at the 8 locks and dams and assisted in these repairs; snags and trees removed, 1,338; old sunken barges removed, 2; trees deadened, 120; pieces floating plant towed, 82; miles run during year, 4,168.	472 snags pulled, 303 trees felled.	100,316 cubic yards	18,121 obstructions removed.	330 snags pulled, 1,197 trees felled.
Character of material dredged.			Gravel		
Average cost per snag		$25 (approximately)	$2	$0.4496	$30 (approximately).
Average cost per yard of dredged material.		No dredging outfit	$0.12		No dredging outfit.

Remarks.
Boat was in ordinary 3 months during the year.

Remarks.
Snag boat first built as a snagging scow 90 feet long, afterwards (1893) lengthened and made self-propelling. Out of commission for extensive repairs at Gasconade, Mo., Nov. 30, 1910, to May 26, 1911.

Remarks.
The boat was hauled out and thoroughly repaired and overhauled during the year.

Remarks.
This snag boat operated on Black Warrior River, Ala., between Lock No. 10 and Lock No. 8, a distance of 64 miles, removing snags and obstructions from channel, and clearing banks of overhanging trees where needed, from July 1, 1910, to January 12, 1911. Men on duty (monthly average), 18.4; overhanging trees felled and cut up, 8,632; overhanging trees felled and pulled back, 3,212; overhanging trees trimmed, 54; bushes cut, 171 cords (estimated); large trees girdled, to deaden, 4; logs cut up and stumps leveled on bank, 1,486; trees removed from river, 2,021; stumps removed from river, 971; snags removed from river, 1,206; logs removed from river, 357; bowlders removed from river, 7; total number of snags and other obstructions removed, 18,121. Dynamite used, 2,475 pounds; caps and exploders used, 700.

Remarks.
Snag boat used for towing, part of season.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Missouri.*	*Navasota.*	*Oconee.*	*Ogama.*	*Pearl.*
District	Kansas City, Mo.	Dallas, Tex.	Savannah	St. Paul, Minn.	Mobile.
Length	187 feet	90 feet 4 inches	Hull, 110 feet; over all, 126 feet.	Hull, 96 feet 6 inches; over all, 112 feet 6 inches.	82 feet.
Beam	52 feet	24 feet 7 inches	24 feet water line, 28 feet over all.	22 feet 3 inches	26 feet.
Depth	7 feet	5 feet	4 feet 4 inches	Amidship, 4 feet; rise forward, 1 foot 6 inches; rise aft, 1 foot 3 inches.	6 feet.
Draft:					
Forward	3 feet	2 feet 1 inch	18 inches	1 foot 4 inches, when loaded ready for work.	2 feet 6 inches.
Aft	3 feet 4 inches	2 feet 10 inches	21 inches		2 feet 8 inches.
Displacement	510 tons	140 tons	136 tons	106 tons	128 long tons.
Builder	James Reese & Sons		U. S. Engineer Department.	Government	Mobile Marine Ry. Co.
Where built	Pittsburgh, Pa.	Orange, Tex.	Macon, Ga.	Grand Forks, N. Dak.	Mobile, Ala.
When built	1888	1904	1897; rebuilt, 1908	1887	1903.
Time to build	No record			3 months 8 days	
Material of hull	Steel	Wood	Wood	Oak	Wood.
Contract cost	$115,000	$2,400	$3,750	$5,687.06 without machinery; total cost, probably $8,000.	$3,250.[1]
Finished cost with outfit	No record	$10,343.17	$7,000	$8,250	
Bucket:					
Type	No dredging outfit	Owen clamshell	None		None.
Capacity		¾ cubic yard			
Height of gallows frame			None		
Length of boom	38 feet 7 inches	43 feet 3 inches		27½ feet	39 feet.
Capacity of boom	200 tons	5 tons		3 tons	30 tons.
Capacity of machine per hour while bucket dredging.		23½ cubic yards			
Dimensions of main hoisting engine cylinders.	Eight 5-inch diameter, 6-inch stroke; eight 10-inch diameter, 12-inch stroke.	8½-inch diameter, 10-inch stroke.		Steam capstan run by 2-foot 4-inch by 6-inch cylinders.	One capstan with 2 engines, 6 by 8 inches.
Dimensions of propelling engine cylinders.	Two 20½-inch diameter, 48-inch stroke; two 32-inch diameter, 48-inch stroke.		8½-inch diameter, 48-inch stroke; 2 in number.	2 feet 8½ inches by 44 inches	8½ by 36 inches.
Diameter of wheel	16 feet 7 inches		11 feet 4 inches	11 feet 6 inches	10 feet 10 inches.
Length and width of buckets.	10 feet 10 inches by 2 feet 6 inches.		12 feet by 12 inches	Thirteen 14 foot by 12 inch buckets.	14 feet long, 14 inches wide.
Revolutions per minute	23		22	16	6.
Speed per hour	3 miles upstream; 10 miles downstream.		3½ miles on average	6 miles	6 miles.

Boilers:					
Number	4	2	1	1	18
Type	Cylindrical (10 flues each)	1 Clyde marine horizontal; 1 Lidgerwood upright.	Horizontal tubular Columbia.	Steamboat return flue	Western river.
Size	20 feet by 42 inches	Horizontal boiler, 84 inches long, 48 inches diameter; upright, 89 inches high, 48 inches diameter.	15 feet 2 inches by 48 inches	42 by 192 inches	40 inches diameter, 18 feet long.
Heating surface (total)	2,240 square feet	Horizontal boiler, 205 square feet; upright, 260 square feet.		230 square feet	420 square feet.
Grate surface (total)	81 square feet	Horizontal boiler, 11.3 square feet; upright, 8 square feet.	4 by 6 feet	11¼ square feet	20.25 square feet.
Working steam pressure.	165 pounds	Horizontal, boiler, 140 pounds; upright, 100 pounds.	140 pounds	110 pounds	180 pounds.
Cost of repairs during year	$2,500	$772.84	$2,000 covering 3 years' operations.	Labor $50, material $72.02; $122.02.	$147.54.
Fuel cost per year	$3,500	$417.80	$1,000	$75	$189.62.
Operating cost per year	$25,881.81	$13,491.83	$12,000, excluding extraordinary repairs.	$381.60 P. R., $7.25 engine supplies; $388.85.	$6,291.34.
Work done during year	901 snags pulled	1,565 snags destroyed; 96 stumps destroyed; 2,480 shore snags cut; 1,699 logs removed and cut up; 6,104 large trees cut; 5,476 small trees cut; 176 cords of wood cut; 1,650 linear feet of jetty repaired; 13,718 cubic yards dredged through shoals.	Snags, 3,359; stumps, 429; overhanging trees, 3,200; logs from bank, 22.	Towing dredging fleet on Red River of the North; bringing subsistence and fuel supplies to the dredge; and removing snags and deadheads from bottom and banks of river.	1,825 obstructions removed.
Average cost per snag	$28.72	$0.75	Impracticable to obtain		$3.45.
Average cost per yard of dredged material.	No dredging outfit	$0.07			
			Remarks. This boat was originally a combined passenger and freight boat fitted up for light snag work. Later a new hull with old house and some new machinery was built, and the boat does very effective work at present, and probably is good for 2 years more. [1] Stern wheel.		*Remarks.* [1] Contract cost is original cost of hull. Boat was remodeled at a cost of $5,805.99, making her a self-propelling boat, in 1908. This boat worked from July 10, 1910, to Jan. 4, 1911.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Pearl.*	*Quapaw.*	*Ransdell, Jos. E.*	*Rattler.*	*Reese, C. B.*
District	New Orleans, La	Little Rock	Vicksburg, Miss.	Philadelphia	Little Rock.
Length	100 feet over all; 85-foot hull	128 feet	137 feet	70 feet	171 feet 6 inches.
Beam	26 feet	30 feet	32 feet	30 feet	36 feet.
Depth	5 feet	4 feet 4 inches	5 feet	7 feet	5 feet 3 inches.
Draft:					
Forward	29 inches	2 feet 4 inches	30 inches	3 feet 3 inches	18 inches.
Aft	31 inches	2 feet 6 inches	40 inches	3 feet	34 inches.
Displacement	130 tons	240 tons	286.60 long tons	182 tons, light	340 tons.
Builder		Howard's Shipyard and United States Engineers.	Ed. J. Howard	John H. Dialogue & Son	Fulton Iron Works and United States engineers.
Where built	Scranton, Miss	Jeffersonville and Little Rock	Jeffersonville, Ind	Camden, N. J	Carondelet, Mo.
When built	1903	1902-3	Apr. 2, 1906, to May 30, 1908	1908	1879.
Time to build		8 months	About 2 years and 2 months		Unknown.
Material of hull	Wood	Wood	Iron and steel	Wood	Iron and steel.
Contract cost		$15,000 (including hired labor)	$42,483	$4,500	$72,325.20.
Finished cost with outfit		About $18,000	$45,402.57	$7,187.28	About $80,000.
Bucket:					
Type		None	Orange peel	Clam shell	None.
Capacity			1 cubic yard	1½ cubic yards	
Length of boom	45 feet	None	40 feet	65 feet	None.
Capacity of boom	40 tons	do	5 tons	10 tons	Do.
Capacity of machine per hour while bucket dredging.		do	60 cubic yards	50 cubic yards	Do.
A Frame (wood):					
Height		30 feet			38 feet 6 inches.
Width at foot		20 feet, center to center			22 feet, center to center.
Width at top		5 feet, out to out			4 feet 8 inches, out to out.
Dimensions of legs		12 by 12 inches			12 inches diameter, made of 3/16-inch plate; 2½ by 2½ by ¼ inch angle stiffeners inside.
Dimensions of main hoisting-engine cylinders.	6 by 8 inches	8 by 10 inches and 6 by 8 inches.	8½ inches diameter, 10-foot stroke.	8 by 10 inches	Two 8 by 16 inches.
Dimensions of propelling-engine cylinders.	8½ inches by 3-inch stroke (2).	12 inches by 3 feet 6 inches	12 inches diameter, 6-foot stroke.	None	15 inches by 4 feet.
Diameter of wheel	10 feet 10 inches	14 feet over all	16½ feet		18 feet 6 inches.
Length and width of buckets.	14 inches by 12 feet	17 feet 6 inches by 20 inches	18 feet long 22 inches wide		18 feet 6 inches by 20 inches.
Revolutions per minute	22	24	18		20.
Speed per hour	7½ miles	8 miles	7 miles (average)		7 miles (average).

Boilers.					
Number	1	3	2	1	3.
Type	Cg'l boiler, Mississippi River type.	2-flue; Mississippi River	Mississippi River cylindrical return flue.	Vertical tubular	5-flue (western river).
Size	40 inches by 21 feet	36 inches by 18 feet	22 feet long, 40 inches diameter.	4 feet diameter, 8 feet 6 inches high.	40 inches by 20 feet.
Heating surface (total).	497½ square feet	678 square feet	995 square feet	384 square feet	1,119 square feet.
Grate surface (total)	27½ square feet	47 square feet	47½ square feet	96 square feet	48 square feet.
Working steam pressure.	150 pounds	165 pounds	181 pounds (limit)	100 pounds	154 pounds.
Cost of repairs during year.	$110.58	$10,716.53	$1,392.52	$794.98	$1,947.11.
Fuel cost per year	$184.87	$719.95 [1]	$2,465.51	$414.79	$1,718.99.[1]
Operating cost per year	$3,196.02	$9,121.91 [1]	$15,973.20	$10,015.53	$14,494.55.[1]
Work done during year	1,548 snags	Snags removed, 1,282; trees cut, 1,591; trees girdled, 791; drifts broken, 69; and miles run, 269.	Snags removed, 2,623; stumps removed, 1,028; leaning trees removed, 1,610; wrecks removed, 2; coal chute constructed, 1; and miscellaneous towing of quarter boats, barges, etc.	(1)	Removed 1,521 snags, 8,565 trees, and 1 drift; ran 1,699 miles.
Average cost per snag	$2.05	Indeterminate	$2.32		Indeterminate.
Average cost per yard of dredged material.		None	No dredging done	$0.09 [2]	None.
	Remarks.	*Remarks.*		*Remarks.*	*Remarks.*
	This boat employed in the New Orleans district during April, May, and June, 1911.	[1] In commission 174 days.		[1] The Rattler is a combination derrick boat, pile driver, and dredge. She was used during the year in constructing pipe lines for rehandling machines, sweeping and removing bowlders, removing wrecks, building banks, etc. [2] The only dredging done during the year was in repairing mud banks.	[1] In commission 250 days.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Riverside.*	*Roanoke.*	*Seizer.*	*Skagit.*	*Socastee.*
District	Little Rock	Norfolk, Va.	San Francisco, Cal	Seattle, Wash	Charleston, S. C.
Length	84 feet	Overall, 115 feet; deck, 100 feet; water line, 96 feet.	136 feet	Hull, 115 feet; wheel, 20 feet; overall, 135 feet.	41 feet.
Beam	22 feet	Overall, 25 feet; on water line, 24 feet.	34 feet 11 inches	31 feet	12 feet.
Depth	3 feet	Depth of hull forward, 5 feet 9 inches; midship, 5 feet 10 inches; aft, 6 feet.	4 feet 8 inches	5 feet	4 feet.
Draft:					
Forward	1 foot 2 inches	3 feet 3 inches	25 inches	3 feet	1 foot 8 inches.
Aft	do	4 feet	do	2 feet 6 inches	Do.
Displacement	57 tons	232 long tons	240 tons	205 tons	18 tons.
Builder	United States engineers	Built by Petersburg Iron Works; lengthened and altered by Chas. J. Colonna.	Stephen Henry Davis	Reed & Shepperd	United States Engineer Department.
Where built	Poplar Bluff, Mo	Built at Petersburg, Va.; lengthened and altered at Norfolk, Va.	Stockton, Cal	Ballard, Wash	Georgetown, S. C.
When rebuilt				1896	
Time to rebuild				6 months	
When built	1904	Built in 1895; lengthened and altered in 1901.	1881		1903.
Time to build	3½ months	Built in about 9 months; lengthened and altered in 3 months.	7 months		6 months.
Material of hull	Wood	Georgia pine	Wood	Wood	Wood.
Contract cost	$2,900 (does not include machinery, etc., from old boat).	To build, $15,321.02; to lengthen and alter, $5,420.	$29,774	$12,000	
Finished cost with outfit	$4,500 (including value of machinery from old boat).	About $21,692.39	$35,000	$25,000	About $1,000, including quarter boat.
Bucket:					
Type	None	Orange peel	None	Orange peel, Hayward	None.
Capacity		1 cubic yard	do	1 yard	
Length of boom		38 feet	50 feet	Two; 35 feet and 60 feet	No boom; A frame 17½ feet.
Capacity of boom	None	15 tons	50 tons	35-foot boom, 70 tons; 60-foot boom, 10 tons.	3 (A frame).
Capacity of machine per hour while bucket dredging.	do	No dredging done during the year.	Not equipped for dredging	75 cubic yards	
A frame (wood):					
Height	28 feet 2 inches				
Width at foot	18 feet 5 inches, center to center.				
Width at top	4 feet 8 inches, out to out				
Dimensions of legs	10 by 10 inches				

Dimension of main hoisting engine cylinders.	4 by 8 inches	Diameter, 12 inches; stroke, 21 inches.	8 by 12 inches	10 by 12 inches	6½ by 12 inches.
Dimensions of propelling engine cylinders.		Diameter, 11¼ inches; length of stroke, 40 inches; diameter of piston rod, 1½ inches.	14 by 60 inches	13½ by 5 inches	Nonpropelling.
Diameter of wheel		12 feet	17½ feet	15 feet	
Length and width of buckets.		Length, 15 feet 5 inches: width, 9 inches.	21 by 1½ feet	Three buckets 14 by 6 feet	
Revolutions per minute		18	17½	24	
Speed per hour		6 miles	8 miles	9 miles	
Boilers:					
Number	1	1	1	1	1.
Type	Vertical	Scotch marine, by Petersburg Iron Works.	Locomotive fire box	Locomotive fire box	Plain flue, vertical.
Size	3 feet 4 inches by 6 feet	Length, 14 feet; diameter, 8 feet.	5 by 20 feet	3 feet 8 inches by 24 feet; over all, 4 by 16 feet.	36 by 96 inches.
Heating surface (total).	185'34	1,100 square feet	1,333 square feet	900 square feet	(¹). 25-horsepower.
Grate surface (total)	6.68 square feet	45 square feet	20 square feet	25 square feet	(¹).
Working steam pressure.	80 pounds	100 pounds	140 pounds	100 pounds	100 pounds.
Cost of repairs during year.	$205.40	$24.40 [1]	$7,350.10	$800	$494.87.[2]
Fuel cost per year	$70.39 [1]	$556.29 [1]	$1,200 to $1,500	$1,200	$11.25.[2]
Operating cost per year	$5,186.02 [1]	$3,888.24 [1]	$10,000 to $15,000	$12,800	$4,534.50.[2]
Work done during year	1,931 snags removed, 6 drifts broken, 3,482 trees cut, and 237 trees girdled.	1,302 logs, snags, trees, stumps, etc., removed.	1,374 snags and trees removed.	Snagging and dredging	3,155 obstructions.
Average cost per snag	Indeterminate	$3.43	$9.235	$3	$1.60.
Average cost per yard of dredged material.	None	No dredging done during the year.	Snag boat is not equipped for dredging.	$0.065	
	Remarks. [1] In commission 214 days.	*Remarks.* [1] During the fiscal year ended June 30, 1911, the U. S. snag boat Roanoke was in commission 6 months and 20 days.			*Remarks.* This hoister, with quarter boat No. 1, was operated on Great Pedee, Little Pedee, and Waccamaw Rivers. The plant was towed up the river in each instance and worked its way down with bank line, removing obstructions on the downward trips only. [1] 25-horsepower. [2] Includes expenses of Georgetown suboffice and superintendence and cost of repairs to quarter boat.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Swan.*	*Tackle.*	*Tipton, David.*	*Tombigbee.*	*Trent.*
District	Pittsburgh, Pa.	San Francisco, Cal.	St. Paul to mouth of Missouri River and tributaries.	Mobile, Ala.	Wilmington, N. C.
Length	138 feet 6 inches	64 feet	165 feet	100 feet, exclusive of 4-inch guard rail.	70 feet.
Beam	Molded, 30 feet; over nosing, 31 feet 4 inches.	28 feet	34 feet	28 feet	20 feet.
Depth	4 feet 6 inches (molded)	3 feet 6 inches	5 feet	5 feet 4 inches	5 feet.
Draft:	Mean draft with full load, 2½ feet.				
Forward	3 feet	15 inches	2 feet 10 inches	2 feet 5 inches	2.1 feet.
Aft	2 feet	do	3 feet 5 inches	2 feet 9 inches	3 feet.
Displacement	264 tons	60 tons	265 tons	151 tons	69 tons.
Builder	James Rees & Sons Co	W. A. Boole & Son	Ed. J. Howard	Ed. J. Howard	United States.
Where built	Pittsburgh, Pa.	Oakland, Cal.	Jeffersonville, Ind.	Jeffersonville, Ind.	Newbern, N. C.
When built	1902	1908	1900	During 1908 and 1909	1899.
Time to build	About 1 year	3 months	9 months	Apr. 20, 1908, to Feb. 5, 1909.	6 months.
Material in hull	Steel	Wood	Wood	Wood	Wood.
Contract cost	$51,800	$4,270	$32,000	$19,000	Built by United States.
Finished cost, with outfit	$61,007	$6,525.62	$34,083.17	$19,500	$10,600.
Bucket:					
Type	None	None		No buckets	Orange peel.
Capacity		do			¾ cubic yard.
Length of boom	Wrecking hook, A frame, 24 feet.	36 feet		Mast, 27 feet; boom, 38 feet	39 feet.
Capacity of boom	60 tons	12 tons		15 tons (safe load)	28 tons.
Capacity of machine per hour while bucket dredging.	Does not dredge	Not equipped for dredging		No buckets	25 cubic yards.
Dimensions of main hoisting-engine cylinders.	Does her hoisting with 2 capstans; each capstan engine has two 6 by 10 inch cylinders.	7 by 10 inches		6½ by 10 inches	7 by 12 inches.
Dimensions of propelling-engine cylinders.	15 inches diameter by 6 feet stroke.	None	18 inches bore, 6 feet stroke	10 inches by 5 feet	7 by 30 inches.
Diameter of wheel	Over buckets, 18 feet	No wheel	22 feet	14 feet	12 feet.
Length and width of buckets.	Buckets, staggered, 18 feet 1 inch long over all, 24 inches wide.	Not self-propelling	11 feet long; 10, 12, 16, 20, and 24 inches wide.	16 feet 2 inches by 15 inches	5 feet by 10 inches.
Revolutions per minute	18		24	16	20.
Speed per hour	10 miles		Varies with stage of water, 6 miles up, 8 miles down stream.	5 to 6 miles	5 miles.

Boilers:					
Number	4	1	3	2	1.
Type	3 flue boilers and one vertical boiler.	Upright Lidgerwood	Horizontal, externally fired.	Fire tubular	Roberts safety water tube.
Size	3 flue boilers are 40 inches diameter by 22 feet 2 inches length over all, with 5 foot 9 inch flues. 1 vertical boiler is 41½ inches diameter by 6 feet 4 inches high, with forty-four 3-inch tubes 35 inches long.	40 inches by 84 inches	20 feet long, 48 inches diameter.	36 inches by 24 feet	5 by 6 by 7 feet.
Heating surface (total).	1,271 square feet heating surface of 3 flue boilers.	312 square feet	1,288 square feet	452.16 square feet	695 square feet.
Grate surface (total)	53 square feet	8½ square feet	48 square feet	40 square feet	28 square feet.
Working steam pressure.	169 pounds	120 pounds	170 pounds	198 pounds	180 pounds.
Cost of repairs during year.	$487		$2,685.88	$418.19	$231.05.
Fuel cost per year	$1,638	$100 to $200	$3,710.49	$242.64	$373.61.
Operating cost per year	$16,790.27, including repairs.	$1,500 to $1,800	$24,391	$9,279.11	$6,497.99.
Work done during year	See remarks	Not in commission during year.	Removing snags and obstructions.	52,732 snags and obstructions removed.	Dredged 411 cubic yards, removed 68 logs, 856 snags, 168 saw logs, 257 stumps, 3 old piles, 2 old scows, 3 wrecks, and 13¾ cords of small snags, and trimmed 435 trees from the channel, and removed 594 trees and 45¾ cords of brush from banks, and trimmed 40 trees therefrom.
Average cost per snag	do	do	$2 to $2.50	$0.176 each	$1.25; per log, $1.16; per cord of small snags, $10.25; per saw log, $1.13; per stump, $1.81.
Average cost per yard of dredged material.	do	Not equipped for dredging		No material dredged	$0.356.
	Remarks.	*Remarks.*		*Remarks.*	
	Tender to dredge boat No. 1, towing and removing abandoned wrecks, etc.	Snag boat and pile driver.		Derrick mast shows some signs of decay. Boat otherwise in good condition.	

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Trinity.*	*Tugaloo.*[1]	*Turtle, Capt.*	*Twining, Wm. J.*	*Vienna.*
District	Dallas, Tex	Savannah, Ga	Wheeling, W. Va	Montgomery, Ala	Mobile.
Length	105 feet	129 feet 3 inches	65 feet	155 feet	100 feet.
Beam	30 feet	34 feet	30 feet	30 feet on water line; 33 feet on deck.	26 feet.
Depth	5 feet	5 feet 6 inches	4 feet 6 inches	4 feet	4 feet 6 inches.
Draft:					
Forward	2 feet	2 feet 6 inches	1 foot 5 inches	2 feet 2 inches	2 feet 1 inch.
Aft	3 feet	3 feet	1 foot 7 inches	2 feet 4 inches	2 feet 7 inches.
Displacement	190 tons	336 tons	75 tons	370 long tons (13,320 cubic feet).	152 tons.
Builder	United States engineer office, Galveston, Tex.	By hired labor[2]	United States	United States	T. C. Gatti.
Where built	Texas City, Tex	At Savannah, Ga	Hull at Marietta, Ohio; machine purchased in New York; erected on Kanawha River, W. Va.	Mobile, Ala	Pascagoula, Miss.
When built	1904	1902	1910	1881	Feb. 8 to June 11, 1911.
Time to build	4 months	July, 1901, to Nov., 1902	About 5 months	6 months	4 months.
Material of hull	Wood	Composite	Wood	Yellow pine	Wood.
Contract cost	$19,500 (including outfit)	$25,000	$6,267	$22,500 (built by hired labor)	$11,342.37.[1]
Finished cost with outfit		$30,000	$8,200	$24,000 (estimated)	$12,154.54.
Bucket:					
Type	Clam shell		Not yet equipped	No dredging attachments	None.
Capacity	1½ yards				
Height of gallow frame		29 feet 9 inches			
Length of boom	40 feet		60 feet		39 feet.
Capacity of boom	18 tons	75 tons	5 tons		30 tons.
Capacity of machine per hour while bucket dredging.					None.
Dimensions of main hoisting-engine cylinders.	10 by 12 inches	Two 10½ by 12 inches	8½ by 10 inches	2 double-cylinder 6 by 6 capstan engines.	2 capstan double cylinders, 5 by 7 inches and 7 by 10 inches.
Dimensions of propelling-engine cylinders.	12 by 48 inches	Two 12 by 5½ inches	Not self-propelling	15½ inches diameter by 5-foot stroke.	10-inch cylinders, 4-foot stroke.
Diameter of wheel	14 feet	15 feet 8 inches (paddle wheel).		18 feet 6 inches diameter by 19 feet 6 inches long.	13 feet.
Length and width of buckets.	16 feet; 20 inches	19 feet; 14 inches			14 feet; 14 inches.
Revolutions per minute	26	24			18.
Speed per hour	8 miles (approximately)	5½ miles			8 miles.

Boilers:					
Number	2	2	1		1.
Type	Horizontal tubular	Columbra	Upright		Western river.
Size	44 inches by 16 feet	19 feet 6 inches long; 5 feet 7 7 inches mean diameter.	50 inches diameter; 102 inches high.		18 feet long; 3 feet 8 inches diameter.
Heating surface (total)	308 square feet	1,54 square feet	434 square feet		633 square feet.
Grate surface (total)	36 square feet	3,409 feet	10.43 square feet		17½ square feet.
Working steam pressure.	150 pounds	150	80 pounds		150 pounds to square inch in cylinder.
Cost of repairs during year	$12,739.21	$764.27	None; not completed		None.
Fuel cost per year	$624	$1,064.32	do		Can not yet be answered, as no work has yet been done.
Operating cost per year	$15,545	$11,371.21	do		Has just been completed, no work has yet been done.
Work done during year	Rebuilding snag boat 6 months; cleaning river 6 months.	4,727 snags, 380 stumps, 1,342 overhanging trees, 198 logs, removing and interlocking steel piling forming a coffer dam.	do		Do.
Average cost per snag	$3.31		No work done		Do.
Average cost per yard of dredged material.					
	Remarks.	*Remarks.*	*Remarks.*		*Remarks.*
	No dredging done during the year.	Has double cylinder hoisting engine with 8 friction drums and[2] gipsies. [1] Stern wheel. [2] Steel frame of hull built by Snare & Triest, New York City, under contract; propelling machinery and boilers built under contract by Sweeney Shipyard & Foundry Co., Jeffersonville, Ind.	This snag boat is now nearing completion. Hull was bought in the fall of 1910 and the machinery in spring of 1911. Derrick has just been erected and machinery is being installed. It is expected to begin operations July 15, 1911.		[3] This is the entire cost of the boat and machinery complete, not including cost of outfit.

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[1] Stern wheel.

[2] Number.

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Waco.*	*Wateree.*	*Woodruff, E. A.*	*Wright, H. G.*
District	Dallas, Tex.	Charleston, S. C.	Cincinnati, Ohio (first)	St. Louis, Mo.
Length	Hull, 118 feet 8 inches	100 feet	220 feet	187 feet.
Beam	30 feet 2 inches	25 feet	48 feet	62 feet.
Depth	5 feet	5 feet 6 inches	6 feet plus 1-foot 6-inch sheer	8 feet.
Draft:				
Forward	2 feet 3 inches	2 feet 10 inches	3 feet 3 inches	4 feet.
Aft	2 feet 7 inches	3 feet	3 feet 6 inches	Do.
Displacement	200 tons	180 tons	863 tons at draft line	1,100 tons (2,240 pounds).
Builder	M. A. Sweeney Shipyard & Foundry Co.	Co-Operative Building & Manufacturing Co. and Georgetown Iron Works.	Machinery, A. Hartupee & Co., Pittsburgh, Pa.; hull, Swift Iron Works, Newport, Ky.; cabins, Richardson, Pittsburgh, Pa.	Western Iron Boat Building Co.
Where built	Jeffersonville, Ind.	Georgetown, S. C.		St. Louis, Mo.
When built	1910	1907	1874–1876	1879–1880.
Time to build	220 days	11 months	1 year 9 months	14 months.
Material of hull	Yellow pine	Wood	Iron and steel	Steel.
Contract cost	$28,935	$3.500 (hull)	$126,137	
Finished cost with outfit	$29,000	$9,404	$133,491.81	$190,000.
Bucket:				
Type	None	None		None.
Capacity		do		
Length of boom	45 feet	40 feet		
Capacity of boom	25 tons			
Capacity of machine per hour while bucket dredging.		No bucket		
Dimensions of main hoisting-engine cylinders.	10 by 12 inches	14 by 16 inches	Duplex, 9 by 14 inches; 8 by 13 inches.	7 by 16 inch double oscillating and 10 by 15 inches.
Dimensions of propelling-engine cylinders.	12 inches by 5 feet	10 by 16 inches	Bore, 20 inches; stroke, 6 feet	22-inch by 6-foot stroke.
Diameter of wheel	15 feet		24 feet	24 feet.
Length and width of buckets	18 inches by 18 feet		10 feet 8 inches long, 12, 18, and 22 inches wide; wheel oval.	12 feet long, 19 inches wide
Revolutions per minute	21	22	20	18.
Speed per hour	10 miles (approximate)	4 miles	8 to 9 miles in still water	8½ miles in still water.
Boilers:				
Number	2 main boilers, 1 auxiliary	1	5	4.
Type	Main are tubular, auxiliary is Scotch marine.	Locomotive	Double flue	Mississippi River.
Size	Main, 44 inches by 16 feet; auxiliary, 48 by 58 inches.	5 feet diameter, 21 feet 6 inches long.	Diameter, 40 inches; length, 26½ feet.	44 inches by 26 feet; flues, two 12 inches diameter, four 7 inches diameter.
Heating surface (total)	Main, 930 square feet; auxiliary, 154 square feet.	1,061 square feet	910 square feet	2,275 square feet.

Grate surface (total)	Main boilers, 32 square feet; auxiliary, 9 square feet.	23 square feet	107½ square feet	72 feet.
Working steam pressure	Main boilers, 170 pounds; auxiliary, 185 pounds.	100 pounds	140 to 160 pounds	150 pounds.
Cost of repairs during year		$142.74 (in service 5½ months)	$5,618.61	$4,906.10.
Fuel cost per year	$250	$622.35 (in service 5½ months)	$2,339.29	$7,230.33.
Operating cost per year	$8,000	Field, $4,184.31; field and office, $4,864.05.	$21,911.49	$31,765.77.
Work done during year	This snag boat has been in service 8 months, and has removed 564 snags and cut 501 shore snags, 5,413 leaning trees, and 156 cords of wood. Topped 17 leaning trees.	Removed 3,045 snags	866 snags, weighing 5,766.47 tons; 50 wrecking jobs.	1,560 snags pulled, 2 drift piles removed, 9 wrecks destroyed.
Average cost per snag	$6.05	Field, $1.374; field and office, $1.5974.	$24.49+	$27.
Average cost per wrecking job			$14	
Average cost per yard of dredged material		No bucket; no dredging		
Average cost per ton of snags removed			$3.80	
	Remarks. The costs above are given for 8 months instead of year.	*Remarks.* The Wateree's hull was old and it gave much trouble, causing breaks in machinery. It was dismantled in December, 1910, and hull beached. Cost per year of 12 months, calculated on basis of 5½ months, as given: Field cost for 12 months, $9,414.70; field and office cost, 12 months, $10,944.11; work done in 12 months, 6,851 snags; cost per month: Field, $784.558; field and office, $912.009.		

TABLE IV.—*Report of operations of snagboats for fiscal year ending June 30, 1911*—Continued.

Name	*Wright, Gen. H. G.*	*York.*	*No. 1.*	*No. 2.*[1]
District	Wilmington, N. C.	Washington, D. C.	Nashville, Tenn.	Galveston, Tex.
Length	89 feet.	72 feet	90 feet.	50 feet.
Beam	25 feet.	22 feet.	24 feet.	22 feet.
Depth	5 feet 6 inches	6 feet.	2 feet 6 inches	7 feet.
Draft:				
Forward	2 feet 6 inches	Light, 2 feet 6 inches; with coal and water, 2 feet 8 inches.	12 inches	2 feet 8 inches.
Aft	3 feet.	2 feet 6 inches and 3 feet 2 inches.	do.	2 feet 4 inches.
Displacement	130 tons	110 tons	64 tons	65 tons.
Builder	United States	H. T. Morrison & Co., contract; rebuilt by Engineer Department, day labor.	United States	Bowers Southern Dredging Co.
Where built	Wilmington, N. C.	Petersburg, Va.; rebuilt at West Point, Va.	Lock 7, Cumberland River	Lockport, La.
When built	1882; rebuilt 1910	1891; rebuilt, 1910	1909-10.	1907.
Time to build	About 1 year (to rebuild)	8 months; time to rebuild, 3 months.	6 months.	3 months.
Material of hull	Wood	Wood	Wood	Wood.
Contract cost	About $3,000; rebuilding, $5,055.88.	$6,129.75 (includes 1 scow and 2 flatboats); rebuilt cost, $5,000.	$3,018.27	$3,316.
Finished cost with outfit	$5,380.88 (including rebuilding)	Contract cost includes outfit	$4,518.27	$5,500.
Bucket:				
Type	Orange peel	None	None	None.
Capacity	½ cubic yard			
Length of boom	38 feet.	40 feet.	do.	40 feet.
Capacity of boom in tons	About 25 tons.	10 tons	do.	15 tons.
Capacity of machine per hour while bucket dredging.	Has never done any dredging		do.	
Dimensions of main hoisting engine cylinders.	Two 8 by 10 inches.	8½ by 10 inches	6½ by 10 inches	7½ by 12 inches.
Dimensions of propelling engine cylinders.	Two 10 by 36 inches.	Propelled by hoisting engine	None.	None.
Diameter of wheel	10 feet.	10 feet.	do.	Do.
Length and width of buckets	10 by 1 feet.	All 3 feet 6 inches long, eight 15 inches wide, eight 10 inches wide.	do.	
Revolutions per minute	20 to 25.	20 for 160 R. P. M. of engine.	do.	
Speed per hour	About 5 miles.	4 miles	Towed by gasoline tender	
Boilers:				
Number	1	1; renewed in July, 1908.	1	2452.
Type	Scotch	Upright tubular	Vertical	Vertical fire tube, American Hoist & Derrick Co.
Size	Diameter, 5 feet 4 inches; length, 10 feet.	30-horsepower	36 by 84 inches	3 feet 2 inches by 7 feet.
Heating surface (total)	345 square feet.	346 square feet.	240 square feet.	256 square feet.
Grate surface (total)	11½ square feet.	8 square feet.	4.8 square feet.	7½ square feet.
Working steam pressure	80 pounds.	125 pounds	80 pounds.	80 pounds.

Cost of repairs during year	$716.87	$4,304.13 (including rebuilding hull).	$175	$554.60.
Fuel cost per year	$651.06	$400 (100 tons of coal)	$50	$794.08.
Operating cost per year	$6,401.35	$5,000 (labor, fuel, oils, etc.)	$500 (per month)	$11,191.94.
Work during year	8,631 logs, trees, snags, stumps, etc., removed.	Snagging Pamunkey River	Snagged Cumberland River	9,495 snags.
Average cost per snag	$0.094	$7.50	Impracticable to give, as the work consists of cutting overhanging trees, removing wrecks and large and small snags.	$1,179.
Average cost per yard of dredged material	No dredging		None dredged	
	Remarks.	*Remarks.*	*Remarks.*	*Remarks.*
	Average cost includes proportionate overhead expense. Cost of repairs includes a new bucket at $325.	Boat is propelled by reversible hoisting engine, by throwing into mesh spin gears on paddle-wheel shaft and drum shaft. These gears are thrown out of mesh when engine is used for other purposes than propulsion.	The snag boat was in commission from the beginning of the fiscal year until October 22, 1910. Began operations at Burnside, Ky., and worked over 477 miles of the river, the following work being done: 300 large snags and 222 small snags removed; 2,218 leaning trees cut, 391 trees trimmed, 848 trees deadened; and one sunken barge removed from the river. The snagging fleet consisted of Snag boat No. 1, accompanied by gasoline tender No. 1, with a crew consisting of 1 overseer, 1 pilot, 2 enginemen, and 10 deckhands. The cost of labor and supplies for the season's work was $3,576.75.	Snag boat working on Guadalupe River between Victoria and mouth of river. [1] Derrick barge.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department.*

[NOTES.—For further particulars see list by districts; length given between perpendiculars.]

CLASS A.—SEAGOING HOPPER DREDGES.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Atlantic	2,670	274	0	47	6	25	0	Steel	9	47	New Orleans.
Benyaurd	2,978	260	0	47	6	23	0	...do	10	53	Do.
Burton	1,510	166	0	38	0	19	0	...do	5	23	Cleveland.
Cape Fear	480	131	9	29	0	12	0	Wood	4	26	Wilmington, N. C.
Caucus	1,400	185	0	41	0	23	2	...do	7	27	Montgomery.
Charleston	800	117	0	30	0	12	0	...do	4	21	Charleston.
Chinook	7,000	445	0	49	0	34	0	Steel	6	39	Portland, Oreg.
Clatsop	1,360	168	0	38	0	23	0	...do	8	36	Do.
Comstock, Gen. C. B.	764	177	0	35	6	16	0	Wood	6	34	Galveston.
Cumberland	1,905	183	0	40	8	20	6	...do	6	29	Savannah.
Delaware	4,000	300	0	52	0	22	6	Steel	9	50	Philadelphia.
Galveston	3,375	290	0	51	0	27	0	...do	6	26	Galveston.
Gedney	1,100	149	0	36	6	16	0	Wood	2	19	Newport.
Key West	1,000	131	0	31	7	15	0	...do	4	22	Jacksonville.
Manhattan	2,670	274	0	47	6	25	0	Steel	9	48	Philadelphia.
Meade, Gen. G. G	1,458	166	0	38	0	19	0	...do	7	24	Grand Rapids.
Navesink	3,150	276	0	47	6	28	0	...do	9	51	New York.
Raritan	2,930	276	0	47	6	28	0	...do	9	50	Do.
Sabine	700	137	0	35	0	12	0	Wood	5	12	Dallas.
Savannah	1,461	166	0	38	0	19	0	Steel	6	29	Savannah.
St. Johns	2,011	191	6	41	4	20	0	Wood	6	34	Jacksonville.
Sumter	1,706	185	0	41	0	22	0	...do	6	34	Charleston.
Winyah Bay	831	136	0	31	6	13	6	...do	4	20	Do.
CLASS B.—HYDRAULIC PIPE LINE DREDGES.											
Augusta	101	74	0	28	0	4	6	Steel	......	......	Savannah.
Barnard	1,291	206	2	38	0	14	0	...do	......	......	Mobile.
Beta	1,300	214	0	58	0	6	11	...do	3	42	St. Louis.
Blackwater	465	110	0	32	0	9	4	Wood	4	21	Montgomery.
Cataract	886	140	6	40	4	10	7	...do	6	31	Philadelphia.
Congaree	250	110	0	32	0	6	0	...do	2	10	Charleston, S. C.
Dalecarlia	132	66	0	24	0	6	0	...do	......	......	Washington, D. C.
Delatour[1]	350	112	0	30	0	5	0	...do	5	10	New Orleans.
Delta	830	175	0	38	0	8	4	Steel	3	37	St. Louis.
Deluge	170	80	0	21	0	4	2	Wood	......	......	Pittsburgh.
Epsilon	650	157	0	40	0	7	6	Steel	3	37	St. Louis.
Etna	266	130	0	28	0	5	0	Wood	2	7	Rock Island.
Flad, Henry	860	192	0	44	0	7	0	Steel	3	40	St. Louis.
Florida[1]	450	131	0	29	9	7	0	...do	4	17	Jacksonville.
Fort Chartres	815	197	0	45	0	7	6	...do	6	48	St. Louis.
Fort Gage	815	197	0	45	0	7	6	...do	6	48	Do.
Gamma	581	138	0	38	0	7	10	...do	3	33	Do.
Geyser	100	100	0	20	0	4	0	Wood	3	6	Rock Island.
Harrod, B. M	1,270	210	0	44	0	8	6	Iron and steel.	3	44	St. Louis.
Hecla	183	120	0	26	0	5	0	Wood	1	8	Rock Island.
Howell, Capt. C. W.[1]	300	125	0	26	0	5	0	...do	5	30	Galveston.
Humphreys, Chas.	234	100	0	32	0	8	9	...do	5	17	Mobile.
Indiana[1]	417	125	0	34	0	6	10	Steel	1	27	Cincinnati.
Iota	800	192	0	44	0	7	0	...do	......	......	St. Louis.
Jacksonville	680	138	4	40	8	10	2	Wood	2	28	Jacksonville.
Kappa	860	192	0	44	0	7	0	Steel	3	40	St. Louis.
Ludlow, Gen	190	162	1	36	9	4	0	...do	......	......	Grand Rapids.
Macon	101	74	0	28	0	4	6	Steel	......	......	Savannah.
Miller, Col. A. M	710	138	6	37	0	13	0	Wood	5	39	Galveston.
Morgan	757	134	6	38	0	8	0	Steel	6	30	Savannah.
Muscogee	281	120	0	30	0	7	6	Wood	2	10	Montgomery.
No. 1–OR	......	80	0	22	0	4	2	...do	......	......	Pittsburgh.
No. 3[1]	200	60	0	30	0	5	0	...do	......	......	Portland, Oreg.
No. 569	194	120	0	30	0	6	0	...do	......	......	Vicksburg.
Oregon	645	120	0	36	0	11	0	...do	3	29	Portland.
Pascagoula	771	150	0	40	0	10	6	Steel	9	31	Mobile.
Pelee	250	119	0	30	0	5	0	Wood	4	14	Rock Island.
Pettus	488	135	0	35	0	6	6	...do	3	30	Montgomery.
Port Arthur	156	60	6	28	0	6	0	...do	3	12	Dallas.
Pump boat No. 1	113	90	0	24	0	3	6	...do	......	5	Chattanooga.

[1] Combination hydraulic and dipper or bucket dredge.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS B.—HYDRAULIC PIPE LINE DREDGES—Continued.

Name, number, or letter.	Displacement.	Dimensions.			Material.	Complement.		District.
		Length.	Beam.	Depth.		Officers.	Men.	
	Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*				
Ram	419	125 0	30 0	7 0	Steel	3	13	New Orleans.
San Pedro	900	140 8	40 8	10 7	Wood	7	29	Los Angeles.
Selma	600	160 0	40 0	6 0	Steel	6	48	St. Louis.
St. Croix	130	80 0	22 0	5 0	Wood	......	......	St. Paul.
Suwanee[1]	95	100 0	24 0	5 0	...do	......	......	Jacksonville.
Thebes	600	160 0	40 0	6 0	Steel	6	48	St. Louis.
Tortoise	196	102 0	24 0	5 6	Wood	......	......	Duluth.
Uncle Sam	450	85 0	34 0	7 0	...do	2	12	Philadelphia.
Vesuvius	290	114 10	30 0	5 0	...do	2	7	Rock Island.
Wahalak	808	150 0	40 0	11 6	Steel	11	33	Mobile.
Warroad	260	100 0	27 0	8 6	Wood	2	7	St. Paul.
Zeta	650	157 0	40 0	7 6	Steel	3	40	St. Louis.
No name	114	60 0	23 0	6 0	Wood	......	......	Norfolk, Va.

CLASS C.—BUCKET AND DIPPER DREDGES.

Name, number, or letter.	Displacement.	Length.	Beam.	Depth.	Material.	Officers.	Men.	District.
"A" Derrick[2]	110	80 0	28 0	4 0	Wood	1	9	Charleston.
Addison	177	75 0	30 0	7 2	...do	......	6	Wheeling.
Ajax	124	73 0	26 0	6 0	...do	1	6	Rock Island.
Ajax	400	82 6	32 8	10 4	...do	2	9	Wilmington, N. C.
Alabama[3]	244	80 0	38 0	6 0	...do	......	7	Chattanooga.
Albany	75	70 0	30 0	4 9	...do	1	6	Montgomery.
Algoma	258	78 6	30 4	7 2	...do	2	13	Milwaukee.
Apache	217	80 0	30 0	8 0	...do	1	6	Rock Island.
Apex	60	80 0	24 0	2 6	...do	......	......	Nashville.
Appleton	214	90 0	32 0	7 0	...do	1	5	Milwaukee.
Attalla	206	75 0	26 4	5 6	...do	......	6	Montgomery.
Autauga	206	75 0	26 4	5 6	...do	2	6	Do.
Barataria[2]	302	102 0	36 0	6 1	...do	......	......	Miss. River (4th).
Carrollton	250	80 0	30 0	6 9	...do	......	9	Cincinnati.
Cascade[2]	90	60 0	30 0	5 0	...do	1	7	Portland, Oreg. (1st).
Casey[2]	164	83 0	28 0	6 6	...do	1	4	Louisville, Ky.
Champoeg	165	80 0	30 0	5 0	...do	1	9	Portland, Oreg. (2d).
Cheraw	620	150 0	29 1	7 1	Steel	2	10	Charleston, S. C.
Cowlitz	162	78 0	34 0	5 6	Wood	1	9	Portland, Oreg. (2d).
Farquhar, Col	250	76 0	24 0	6 0	...do	......	......	Grand Rapids.
Frankfort	115	72 0	19 0	5 5	...do	......	9	Cincinnati.
Frontenac (being rebuilt).	....	100 0	34 0	7 0	...do	2	6	Oswego.
Green River	268	112 0	31 0	4 0	...do	1	7	Louisville.
Hell Gate[2]	720	110 0	35 0	12 0	...do	......	......	Philadelphia.
Hercules[2]	670	100 0	38 0	11 4	...do	1	11	Wilmington, N. C.
Kentucky	326	100 0	34 0	6 10	...do	......	10	Chattanooga.
Kwasind	187	80 0	28 0	6 6	...do	......	8	Do.
Louisville	128	64 0	28 0	6 0	Iron	......	6	Louisville.
Malta[3]	160	70 0	31 4	6 10	Wood	......	9	Cincinnati.
Maumee	549	100 0	36 0	11 0	...do	2	11	Cleveland.
Ohio	270	110 0	31 6	6 8	Iron	1	18	Cincinnati (1st).
Omro	150	100 0	30 0	6 0	...do	1	4	Milwaukee.
Oakosh	234	75 0	31 0	6 0	Wood	1	8	Do.
Oswego	235	92 0	31 6	6 1	Iron	1	11	Cincinnati.
Otter Tail	120	75 0	24 0	6 0	Wood	2	7	St. Paul.
Ogama	106	96 6	32 3	4 0	...do	2	5	Do.
Phoenix	186	80 0	30 0	8 0	...do	1	5	Rock Island.
Rosecrans	176	111 0	22 0	5 0	...do	......	6	Wheeling.
Saginaw[2]	92	83 9	28 0	6 7	...do	......	......	Grand Rapids.
Sapelo[2]	160	85 4	30 8	5 5	...do	......	......	Savannah.
Scuppernong[2]	128	78 0	32 0	7 0	...do	2	8	Wilmington, N. C.
Tennessee	375	100 0	34 0	6 10	...do	......	10	Chattanooga.
Upatoi	212	85 0	30 0	6 0	...do	2	8	Montgomery.
Vulcan	240	80 0	30 0	8 0	...do	1	5	Rock Island.
Wabash	126	79 0	26 0	6 0	...do	......	6	Louisville.
Wallowa	175	125 0	25 6	5 0	...do	3	11	Portland, Oreg. (1st).
Wolf	73	80 0	28 0	4 6	...do	2	5	Memphis.
Wolfe, L. C.[2]	114	60 6	32 6	4 7	...do	......	2	Wheeling.
No. 1[2]	375	87 0	30 8	8 0	...do	......	......	Charleston.

[1] Combination hydraulic and dipper or bucket dredge.
[2] Bucket dredge.
[3] Ladder dredge.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS C.—BUCKET AND DIPPER DREDGES—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
No. 1[1]	187	79	10	30	0	7	4	Wood		5	Chicago.
No. 1	62	90	0	24	0	2	6	...do			Nashville.
No. 1	295	85	0	32	0	6	2	...do	2	7	Pittsburgh.
No. 1[1]	115	65	0	27	0	6	6	...do			Galveston.
No. 2[1]	195	79	10	30	0	7	8	...do		5	Chicago.
No. 2	197	86	6	30	0	4	8	...do	2	7	Pittsburgh.
No. 2 Wheeling[1]	130	70	6	32	0	4	0	...do			Wheeling.
No. 3 Wheeling	95	70	6	30	7	4	6	...do			Do.
No. 6	90	90	0	24	0	5	0	Wood and steel.			Mobile.
No. 19[2]	99	76	0	25	0	6	8	Wood			Do.
No. 24 Wheeling[1]	161	75	0	35	0	4	10	...do			Wheeling.
No. 68	200	100	0	34	0	6	0	...do			Little Rock.

CLASS D.—SNAG BOATS.

Apex	66	80	0	24	0	3	0	Wood			Nashville.
Arkansas	235	140	0	30	0	4	6	Steel	3	20	Little Rock.
Black Warrior	305	136	6	33	2	4	4	Wood	2	15	Mobile.
Chattahoochee	233	140	0	29	0	4	0	...do	3	22	Montgomery.
Choctawhatchee	115	90	0	24	0	3	6	...do	2	8	Do.
Columbia	137	121	0	26	0	3	3	...do	3	20	Vicksburg.
Conecuh	37	60	0	20	0	3	0	...do	1	8	Montgomery.
Culberson, C. A	200	106	0	28	0	5	0	...do	4	12	Dallas.
Delatour[2]	350	112	0	30	0	5	0	...do			New Orleans.
Demopolis	96	82	3	25	6	4	9	...do	2	11	Mobile.
Escambia	112	92	0	25	0	4	0	...do	2	8	Montgomery.
Escatawpa	62	60	0	20	0	4	0	...do	2	11	Mobile.
Flint	127	95	0	24	0	4	0	...do	3	9	Montgomery.
Florence, Thos. B	107	96	0	20	0	4	0	Iron and steel.	3	9	Vicksburg.
Great Pedee	188	100	0	25	0	3	6	Wood			Charleston.
Guadalupe	227	118	0	28	0	5	11	...do	2	10	Galveston.
Howell, C. W	304	146	0	36	0	5	0	Iron and steel.	3	23	Vicksburg.
Humphreys, Ben[2]	286	137	0	32	0	5	0	...do	3	23	Do.
Johnson, A. B	48	84	0	22	0	3	0	Wood	1	11	Little Rock.
Kentucky	370	127	0	30	0	5	6	...do		16	Cincinnati.
Kissimmee	65	60	0	18	0	4	0	...do	2	5	Jacksonville.
Macomb, J. N	1,160	177	6	62	0	8	0	Steel	6	36	St. Louis.
Mammoth Cave[2]	284	120	0	30	0	5	0	...do	3	15	Louisville.
Mandan	150	138	0	24	0	4	7	...do	3	14	Kansas City.
Mathloma	177	140	0	34	0	5	0	Wood	3	11	Portland, Oreg. (2d).
McCalla, R. C	133	100	0	28	0	5	0	...do	3	15	Mobile.
McPherson, James B	340	170	0	36	0	5	7	Steel	4	18	Kansas City.
Missouri	510	187	0	52	0	7	0	...do	5	36	Do.
Navasota	140	90	0	25	0	5	0	Wood	2	12	Dallas.
No name	17	30	0	26	5	3	5	...do			Jacksonville.
Oconee	136	110	0	24	0	4	4	...do	3	11	Savannah.
Pearl	128	82	0	26	0	6	0	...do	3	11	Mobile.
Quapaw	240	128	0	30	0	4	4	...do	3	19	Little Rock.
Ransdell, Jos. E.[2]	286	137	0	32	0	5	0	Iron and steel.	3	23	Vicksburg.
Rattler	182	70	0	30	0	7	0	Wood			Philadelphia.
Reese, C. B	340	171	6	36	0	5	3	Iron and steel.	3	27	Little Rock.
Riverside	58	84	0	22	0	3	0	Wood	1	11	Do.
Roanoke[2]	232	100	0	24	0	5	10	...do	3	5	Norfolk.
Seizer	240	136	6	34	11	4	8	...do	3	29	San Francisco.
Skagit	205	115	0	31	0	5	0	...do	3	8	Seattle.
Socastee	18	41	0	12	0	4	0	...do			Charleston, S. C.
Swan[2]	264	138	6	30	0	4	6	Steel	3	11	Pittsburgh.
Tackle[2]	60	64	0	28	0	3	6	Wood		6	San Francisco.
Tipton, David	265	164	0	34	0	5	0	...do	7	19	Rock Island.
Tombigbee	151	100	0	28	0	5	4	...do	3	14	Mobile.
Trent	70	70	0	20	0	5	0	...do	2	8	Wilmington, N. C.
Trinity[2]	190	105	0	30	0	3	0	...do	4	12	Dallas.
Tugaloo	336	129	3	34	0	5	6	...do	3	12	Savannah.
Turtle, Capt	75	65	0	30	0	4	6	...do		10	Wheeling, W. Va.
Twining, Wm. J	370	155	0	30	0	4	0	...do	4	15	Montgomery.

[1] Bucket dredge.

[2] Combination.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS D.—SNAG BOATS—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Umatilla	300	159	9	34	4	5	1	Wood	3	14	Portland, Oreg.
Vienna	152	100	0	26	0	4	6	...do	2	12	Mobile.
Waco	200	118	8	30	2	5	0	...do	4	12	Dallas.
Wateree	180	100	0	25	0	5	6	...do			Charleston.
Woodruff, E. A	863	220	0	48	0	6	0	Iron, steel, and wood	6	31	Cincinnati.
Wright, Gen. H. G	100	102	0	20	6	5	0	Wood	2	7	Wilmington, N. C.
Wright, H. G	1 100	187	0	62	0	8	0	Steel	6	36	St. Louis.
York	110	72	0	22	0	6	0	Wood			Washington, D. C.
No. 1	64	90	0	24	0	2	6	...do	2	14	Nashville.
No. 2—Derrick Barge	65	50	0	22	0	7	0	...do			Galveston.

CLASS E.—TUG AND SURVEY BOATS, SCREW.

Arago	130	89	10	18	0	9	0	Wood	2	7	Portland, Oreg.
Argonauta	36	80	0	18	4	8	0	...do			Charleston.
Argus	134	80	9	15	5	9	0	Iron	1	1	New York.
Brewerton		58	4	15	7	8	11	Wood	2	1	Oswego.
Casey, T. L	90	60	0	15	0	8	0	Steel	2	2	Buffalo.
Castle	165	94	4	19	0	10	6	...do	2	6	New London.
Caswell, Richard	200	74	6	18	6	10	0	...do	2	7	Wilmington, N. C.
Cerebus	260	100	0	21	0	12	4	...do	4	5	New York.
Chickasaw	155	99	6	18	4	9	9	...do	2	10	Mobile.
Chipeta	44	66	0	14	0	8	1	Wood			Washington, D. C.
Circle	43	49	5	13	0	6	7	...do	2	1	Duluth.
Coquet	120	54	0	18	6	7	0	...do	2	6	Wilmington, N. C.
Cora	220	140	0	23	0	12	0	...do	1	10	Newport.
Cynthia	125	68	0	17	0	7	10	...do	2	6	Wilmington, N. C.
Donovan, C	180	95	0	19	6	10	0	Iron	2	4	New Orleans.
Engineer	157	106	0	20	0	11	0	...do			Manila.
Engineer	130	91	0	18	0	7	6	Wood	2	4	New York.
Essayons	130	74	6	21	0	11	6	Steel	2	3	Duluth.
Frolic	44	68	8	16	9	5	0	Wood			Guantanamo.
Gibbon	124	61	9	10	0	8	8	...do	2	11	Savannah.
Gillmore, Gen	47	61	6	15	0	4	10	Iron and wood.			Grand Rapids.
Hancock	151	96	6	17	0	7	6	Wood	1	7	Detroit.
Harding, Horace	215	79	8	22	0	10	6	...do	2	6	Mobile.
Harwood, Col	107	75	2	17	2	9	7	...do	1	3	Boston.
Hillsboro	28	89	0	14	6	6	5	...do	2	4	Jacksonville.
Humphreys, Gen. A. A	50	71	6	16	0	7	0	...do	2	5	Philadelphia.
Industry	110	71	8	16	0	8	6	...do	4	4	Milwaukee.
Lamont	275	100	0	22	0	12	4	Steel	4	5	New York.
Lusk, Col. J. L	295	114	6	19	4	11	10	Wood	2	12	Detroit.
Maguire, Capt	49	67	0	17	7	4	2	...do	2	5	Jacksonville.
Manchac	113	78	0	16	0	7	0	...do			New Orleans.
Manisees	225	102	0	22	0	9	0	...do	4	5	New York.
Manitowoc	186	100	0	20	0	10	6	Steel	3	5	Milwaukee.
Marengo	137	80	0	18	2	8	8	...do			New Orleans.
McGregor	79	69	0	14	3	7	1	Wood	3	4	Norfolk.
Mendell, G. H	94	91	0	18	3	8	4	...do			Portland, Oreg.
Morganza	180	92	0	19	0	8	8	Steel			New Orleans.
Nimrod	245	95	0	21	0	8	1	Wood	4	5	New York.
Noble, Alfred	83	67	6	15	6	7	1	Steel	1	3	Detroit.
Parker	98	65	0	16	4	7	2	Wood	2	2	Vicksburg.
Philadelphia	55	67	0	16	0	7	6	Steel	2	5	Philadelphia.
Picket	32	52	0	12	3	6	3	Wood	1	3	New Orleans.
Pontonier	50	80	0	18	0	3	6	Steel		2	Washington, D. C.
Quest	46	65	0	15	0	8	0	Wood	2	3	Cleveland.
Rumsey, James	127	120	0	22	0	4	3	Steel	1	7	Wheeling.
Sapper	160	68	0	16	10	9	7	...do	1	3	Detroit.
San Pedro	113	92	10	20	10	10	6	...do			Manila.
Scout	183	96	0	19	0	11	5	...do	4	5	New York.
Search	200	133	0	17	6	10	0	...do	2	11	Detroit.
Sentinel	170	90	6	19	0	9	6	...do	3	7	Baltimore.
Spear	160	85	0	20	0	10	0	Wood	2	4	Cleveland.
Surveyor	175	86	9	20	1	8	5	...do	2	12	Detroit.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS E.—TUG AND SURVEY BOATS, SCREW—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Talfor, Capt	43	77	0	16	2	8	0	Wood	2	5	Galveston.
Tonty	120	96	1	16	0	5	6	Steel	2	5	New Orleans.
Tunica	205	90	0	19	0	9	8	...do	......	......	Do.
Tuscaloosa	212	82	0	22	0	8	3	Wood	2	6	Mobile.
Uacha	43	62	0	14	0	7	6	Iron	2	3	New Orleans.
Vidette	124	87	7	14	9	7	7	Wood	2	5	Duluth.
Do	200	99	1	21	0	10	0	Steel	4	7	Philadelphia.
Vigilant	275	10	2	22	0	12	0	...do	4	7	New York.
Visitor	90	80	8	20	0	6	4	...do	2	5	Cleveland.
Warren, Gen	75	72	2	17	0	5	0	Wood	......	......	Washington, D. C.
West Neebish	47	53	3	15	1	8	2	...do	1	2	Detroit.
Wilson	106	94	0	19	6	11	0	Steel	3	9	Seattle.
No. 1, U. S. L. S	56	65	0	13	6	6	6	Wood	2	4	Detroit.
No. 2, U. S. L. S	48	60	6	14	6	7	6	...do	2	6	Do.

CLASS F.—TOW AND SURVEY BOATS, PADDLE.

Name, number, or letter.	Displacement.	Length.		Beam.		Depth.		Material.	Officers.	Men.	District.
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Ada	30	68	0	11	0	3	0	Wood	2	4	Rock Island.
Alabama	219	134	5	26	4	4	0	...do	4	14	Montgomery.
Alert	135	115	0	19	6	3	10	...do	2	9	Rock Island.
Alexander, Gen	110	75	0	18	4	8	0	...do	......	......	San Francisco.
Allen, A. D	145	125	0	25	0	4	5	...do	1	8	Little Rock.
Arethusa	45	91	0	18	4	4	8	...do	2	5	Kansas City.
Atalanta	45	91	0	18	4	4	8	...do	......	......	Do.
Aux Vasses	50	55	0	13	0	3	2	...do	1	4	St. Louis.
Beaver [1]	62	81	0	12	0	4	0	...do	2	5	Memphis.
Bosse, Henry	100	100	0	19	6	3	10	...do	1	8	Rock Island.
Cahokia	90	81	0	18	0	3	3	...do	1	4	St. Louis.
Casey, Gen. T. L	125	143	0	28	0		0	...do	......	......	Do.
Cherokee	169	124	6	25	0	4	0	Wood and iron.	3	7	Louisville.
Chilhowee	104	100	0	20	0	3	0	Wood	1	5	Chattanooga.
Chisca	450	160	0	30	0	5	0	...do	4	13	Memphis.
Choctaw	560	171	6	36	0	5	6	Steel	2	12	St. Louis.
Cinque Hommes	90	81	0	18	0	3	3	Wood	1	4	Do.
Cleveland	90	110	0	20	0	3	9	...do	1	8	Little Rock.
Coal Bluff	175	128	0	25	0	4	6	...do	......	......	Rock Island.
Colbert	185	142	0	25	6	4	6	...do	1	5	Chattanooga.
Columbus	227	134	0	20	0	4	0	...do	3	24	Montgomery.
Control	232	136	0	29	0	4	0	...do	4	10	Vicksburg.
Coosa [2]	69	80	0	18	0	4	6	...do	1	5	Montgomery.
Coppee, H. St. L	350	140	0	30	0	6	0	Steel	8	18	Vicksburg.
Cumberland	171	130	0	24	0	4	0	Wood	1	5	Nashville.
Elinor	213	125	0	25	0	4	0	...do	2	12	Rock Island.
Ellen	200	124	0	26	6	4	5	...do	1	7	Do.
Elsie	40	67	0	13	0	3	0	Steel	2	5	Do.
Emerald	30	65	6	12	0	3	0	Wood	2	3	Louisville.
Emily	25	67	0	12	0	3	0	...do	2	3	Rock Island.
Fox	128	102	0	18	4	5	0	...do	3	4	Milwaukee.
Do	19	69	2	12	3	3	0	...do	2	3	Chicago.
Fury	150	113	0	22	0	3	10	...do	2	7	Rock Island.
Gasconade [2]	10	48	10	12	0	2	6	...do	1	2	Kansas City.
Grace	38	79	0	17	0	3	3	...do	2	3	Rock Island.
Graham	138	118	0	21	0	3	0	...do	3	7	Memphis.
Gregory	240	115	0	22	0	4	2	...do	......	8	Cincinnati.
Henry	34	86	0	18	0	2	6	...do	1	4	Nashville.
Hider, Arthur	350	140	0	30	0	6	0	Steel	8	18	Vicksburg.
Hiwassee	104	100	0	20	0	3	0	Wood	1	3	Chattanooga.
Hyacinth	75	89	0	18	4	2	6	...do	2	3	New Orleans.
Isle de Bois	50	55	0	13	0	3	2	...do	1	4	St. Louis.
Itasca	80	76	0	15	0	5	0	Iron	2	2	Memphis.
Joachim	90	81	0	18	0	3	3	Wood	1	4	St. Louis.
John	34	86	0	18	0	2	6	...do	1	4	Nashville.
Kaskasia	150	100	0	24	0	4	3	Steel	1	4	St. Louis.
King, Col. W. R	37	68	4	15	6	3	0	Wood	1	3	Chattanooga.
King, W. R	716	190	0	41	0	5	0	Steel	6	28	St. Louis.
Leona [2]	10	46	0	12	0	3	0	Wood	1	1	Rock Island.
Leota	167	120	0	20	0	4	10	...do	2	4	Montgomery.
Do	560	171	6	36	0	5	6	Steel	2	12	St. Louis.

[1] Formerly W. M. Rees.

[2] Gasoline.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS F.—TOW AND SURVEY BOATS, PADDLE—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Little Ben	5	45	0	11	0	1	6	Wood			Nashville.
Loma	31	83	0	15	7	4	7	...do	1	5	Wheeling.
Lookout	180	116	0	24	0	3	6	...do	1	7	Chattanooga.
Louise	39	61	0	12	0	3	0	Steel	2	3	Rock Island.
Lucia	25	68	0	12	8	3	0	Wood	1	4	Do.
Mac	35	73	0	16	0	3	0	...do	2	3	Do.
Marion	54	80	0	18	0	3	8	...do	2	4	Do.
Mars	83	80	0	17	0	3	9	Steel	1	6	St. Louis.
Mary, Mc [1]	12	43	0	8	0	4	0	Wood	1	1	Rock Island.
McPherson	113	115	0	21	9	3	10	...do	1	5	Chattanooga.
Mercury	83	80	0	17	0	3	9	Steel	1	6	St. Louis.
Meramic	150	100	0	24	0	4	3	...do	1	4	Do.
Merrill	163	115	0	22	0	3	0	Wood			Cincinnati.
Minnetonka	490	176	5	29	9	5	4	...do	4	13	Memphis.
Mississippi	540	174	0	32	0	6	0	Steel	4	36	St. Louis.
Newton, Gen. J	560	149	0	24	0	7	6	...do			New Orleans.
Niota [1]	25	70	0	14	0	3	0	Wood			Chattanooga.
Nokomis	338	171	6	36	0	5	6	Steel	2	12	St. Louis.
Nugent	191	120	0	24	0	3	6	Wood	3	10	Mobile.
Ogama	106	112	6	23	3	4	0	...do			St. Paul.
Oriole	60	107	0	22	4	4	1	...do	4	29	Do.
Osage	14	60	0	14	0	2	7	...do	1	2	Kansas City.
Patrol	220	130	8	28	0	4	9	...do	2	11	St. Louis.
Pearl	45	85	1	18	0	4	1	...do	2	4	Chicago.
Plaquemine	300	136	0	20	0	5	0	Steel			New Orleans.
Ramos	71	100	0	22	6	3	1	Wood			Do.
Roberts, T. P	206	115	0	22	8	4	0	...do	2	7	Pittsburgh.
Ruth	35	75	0	17	0	3	3	...do	2	4	Rock Island.
Sachem	560	171	6	36	0	5	6	Steel	2	12	St. Louis.
Salvisi	150	100	0	24	0	4	3	...do	1	4	Do.
Search	200	120	6	22	3	4	0	Wood	3	19	Do.
Shawnee	172	119	0	25	0	4	6	...do	2	5	Louisville.
Simpson, Gen. J. H	525	170	0	32	0	5	0	...do	6	24	St. Louis.
Slackwater	229	120	0	26	4	4	3	...do	2	21	Pittsburgh.
Sylph [1]	38	72	0	16	0	2	9	...do	1	2	Mobile.
Teche	90	100	0	20	4	4	6	Steel			New Orleans.
Tensas	78	93	6	20	4	4	0	...do			Do.
Titan	340	142	0	27	0	6	0	Wood	3	12	Memphis.
Tom Ray	9	60	0	18	0	1	6	...do			Nashville.
Vega	112	104	0	17	4	4	0	...do		8	Cincinnati.
Venus	50	80	0	17	0	3	9	Steel	1	6	St. Louis.
Vulcan	83	80	0	17	0	3	9	...do	1	6	Do.
Wave Rock	25	55	0	12	0	2	1	Wood		5	Louisville.
White Oak [1]	75	90	0	18	0	3	0	...do	1	2	Chattanooga.
Wolf	114	83	0	19	0	4	6	...do			Milwaukee.
Wynoka	560	171	6	36	0	5	6	Steel	2	12	St. Louis.
No name	68	73	0	15	0	3	6	Wood			Charleston.

CLASS G.—STEAM LIGHTERS.

Executive	236	86	3	20	0	8	5	Wood	1	3	Boston.
Lee, W. H	500	124	8	29	7	11	7	...do	4	8	Oswego.
Pioneer	200	90	0	28	0	7	6	...do			Guantanamo.
Panuco	287	107	0	28	0	8	6	...do	2	6	New London.
Socastee	23	41	0	12	0	4	0	...do			Charleston.

CLASS H.—LAUNCHES.

Albatross	1.7	30	0	5	10	2	6	Wood			Pittsburgh.
Alberito		26	0	5	8	1	3	...do			Rock Island.
Amelia	6	35	0	8	0	3	6	...do			Savannah.
Angler	112	85	6	16	0	10	6	...do	2	5	Do.
Arc	1	16	0	4	5	2	0	...do		1	Duluth.
Ariadne	17	45	6	9	0	4	8	...do		1	Milwaukee.
Ariel	6	36	0	7	6	5	0	...do			Cleveland.
Arrow	1.75	31	6	7	4	3	5	...do		2	Montgomery.

[1] Gasoline.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS H.—LAUNCHES—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Bar	2	27	0	7	0	3	0	Wood	1	1	Galveston.
Bass		26	0	5	3	1	3	...do			Rock Island.
Bastrop	16	46	6	11	3	5	0	...do	1	1	Galveston.
Beatrice		30	0	6	6	3	2	...do			New Orleans.
Beetle		26	0	5	1	1	5	...do			Rock Island.
Bertha S	47	33	0	6	6	2	0	...do			Grand Rapids.
Biloxi	25	37	0	13	0	4	2	...do	2	1	Mobile.
Birch	1.5	28	0	6	6	2	6	...do			St. Louis.
Bittern		26	0	5	3	1	3	...do			Rock Island.
Bonne Femme		24	8	5	6	2	5	Steel			Kansas City.
Brazos	15	50	0	14	0	2	2	...do	2	3	Dallas.
Bull Calf	1	23	0	6	0	3	4	Wood		1	St. Paul.
Bully	1	20	6	5	8	3	0	...do	1	1	Galveston.
Burton No. 1	.9	16	0	4	6	3	0	...do			Cleveland.
Caddo	2.5	30	0	8	0	3	0	...do			Dallas.
Calumet	2	22	0	5	0	1	4	...do			Chicago.
Carolina	28	82	0	12	6	5	0	...do			Charleston.
Catoma	2	25	0	7	3	2	4	...do			Montgomery.
C. B. C	1	20	4	6	0	3	0	...do	1	1	Galveston.
Chord	2	20	4	5	5	2	7	...do		1	Duluth.
Cobra		26	0	5	3	1	3	...do			Rock Island.
Columbia	2.2	30	0	6	0	1	11	...do		1	Charleston.
Commodore	1	23	4	6	0	3	2	...do			Galveston.
Cosine	3	26	0	7	2	3	0	...do			Savannah.
Curlew		20	0	5	9	1	0	...do			Rock Island.
Curve	2	20	4	5	5	2	7	...do		1	Duluth.
Davy		24	8	5	3	1	8	...do			Rock Island.
Dawho[1]	25	50	0	13	0	8	0	...do	2	1	Charleston.
Dearborn	9	50	0	8	6	3	2	Steel	2		Chicago.
Delaware	2	20	2	6	8	3	2	Wood			Philadelphia.
De Soto	14	57	6	10	7	5	1	...do	2	2	Jacksonville.
Dispatch		23	0	4	6	1	10	...do			Rock Island.
Do	2	21	0	5	4	2	7	...do			Vicksburg.
Dolly	2½	25	0	6	0	2	0	...do			Portland, Oreg.
Do		26	0	5	3	1	3	...do			Rock Island.
Dolphin	4	20	0	6	0	2	6	...do			Do.
Don	9	41	9	9	7	3	6	...do	1	1	Detroit.
Dorothy	1.5	22	2	6	11	1	4	...do			Philadelphia.
Dunkirk	.75	24	6	6	8	3	0	...do			Buffalo.
E. A. W	16	30	0	9	6	2	6	Steel			Cincinnati.
Echo River	4	39	8	7	5	3	2	Wood		1	Louisville.
Engineer	10	37	6	7	8	3	0	...do			Grand Rapids.
Do	4	30	0	6	6	2	8	...do		1	Washington.
Engineer, U. S	6.3	30	0	6	5	3	1	...do		1	Newport.
Enif	7	30	0	7	6	4	6	...do		1	Jacksonville.
Enquirer		30	4	7	0	3	0	...do			Kansas City.
Etowah	5	15	10	5	3	1	10	...do			Montgomery.
Eufaula	2	25	0	7	3	2	4	...do			Grand Rapids.
Eureka	1.8	30	2	7	8	3	2	...do		1	Dallas.
Do	3	25	0	8	6	3	3	...do			Portland, Oreg.
Firefly		26	0	5	1	1	5	...do			Rock Island.
Folly		26	0	5	3	1	3	...do			Do.
Fox		26	0	5	3	1	3	...do			Do.
Frances	7	33	0	7	0	3	0	...do		2	Wilmington, N. C.
Freak	5	27	0	8	0	3	3	...do		1	Jacksonville.
"G"	1.5	25	0	8	0	3	0	...do	1	1	Galveston.
Gannet	35	72	0	12	6	4	7	...do	1	3	Wilmington, Del.
Gar		26	0	5	3	1	3	...do			Rock Island.
Gazelle	73	59	0	17	6	7	0	...do	1	4	Newport.
Gem	6	40	0	8	0	3	0	...do			Savannah.
Gnat		26	0	5	1	1	5	...do			Rock Island.
Gwendolen	8	28	0	8	0	4	6	...do	1	1	Buffalo.
Hancock	1.5	15	6	4	6	2	6	...do			Detroit.
Helen	33	56	0	12	4	6	0	...do	1	1	Galveston.
Heron	11	36	0	9	6	4	0	...do		1	Milwaukee.
Hill	6.9	30	9	7	7	2	6	...do	1	1	Galveston.
Hilo	8.5	35	0	7	6	4	6	...do			Honolulu.
Hinda	5	28	0	7	6	2	3	...do		3	Wilmington, Del.
Holly		26	0	5	3	1	3	...do			Rock Island.
Hornet		26	0	5	3	1	3	...do			Do.
Hospital Point		15	6	4	0	2	0	...do			Norfolk.
Ingalls, Gen	14	43	0	8	2	4	8	...do	2		New York.
Ino	1	22	0	6	8	2	6	...do		1	Dallas.

[1] Gasoline.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS H.—LAUNCHES—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
Inspector	6	34	0	7	0	4	6	Wood			Cleveland.
Do	26	50	0	8	9	4	8	Steel			Milwaukee.
Jennie	5	30	0	8	0	3	2	Wood			Portland, Oreg.
Jolly		26	0	5	3	1	3	do			Rock Island.
Jordan	8.5	28	10	9	10	3	0	do	1	4	Mobile.
Juanita	1	22	0	6	0	2	2	do		1	Dallas.
Katherine	6	25	0	5	11	3	2	do			Guantanamo.
Do	2	30	5	7	11	3	11	do			New London.
Kingfisher	19	41	1	10	0	4	4	do		1	Milwaukee.
Lake Drummond		24	2	6	5	2	7	do			Norfolk.
Lally		26	0	5	3	1	3	do			Rock Island.
Lark		26	0	5	3	1	3	do			Do.
Leaf	4.5	32	0	7	6	4	0	do	1		Mobile.
Linnet		26	0	5	3	1	3	do			Rock Island.
Locust		26	0	5	1	1	5	do			Do.
Lookout	2	26	0	4	0	2	6	do			New York.
Loon		26	0	6	0	1	6	do			Rock Island.
Louise	13	40	0	10	0	5	0	do			Charleston.
Ludington	1.47	22	0	5	0	2	3	do			Grand Rapids.
Lunette	3	20	0	5	6	3	6	do		1	Jacksonville.
Luzon	12	53	0	9	4	4	6	do	1	1	Pittsburgh.
Mallard	9	35	0	9	0	3	9	do		1	Milwaukee.
Mac	3.5	27	0	6	0	3	0	do			Jacksonville.
Madge	4	25	0	6	0	3	0	do			Rock Island.
Mamie K	2	25	0	6	0	2	7	do	1		Mobile.
Margaretta	3	21	0	5	6	2	6	do			Portland, Oreg.
Marie		29	0	8	0	4	0	do		1	New York.
Mascot	7	61	0	8	0	3	7	Steel			Wheeling.
M. C		16	0	4	0	1	10	Wood			Chicago.
Mercur	60	74	9	13	3	7	0	Steel	2	3	Wilmington, N. C.
Merry Widow	1.2	28	0	5	6	2	0	Wood		1	Charleston.
Messenger	1.33	17	6	5	6	2	3	do			Grand Rapids.
Metric	2	22	3	5	0	2	3	do		1	St. Louis.
Mignon	.5	18	0	5	2	2	1	Steel			Cincinnati.
Mohawk	5.5	30	6	8	0	3	9	Wood			Portland.
Molly		26	0	5	3	1	3	do			Rock Island.
Moreau		20	0	5	1	2	1	Steel			Kansas City.
Mosquito		26	0	5	1	1	5	Wood			Chicago.
Moth		26	0	5	1	1	5	do			Rock Island.
M R C		19	6	4	10	1	3	do		1	St. Louis.
Myra	10	40	0	7	4	3	6	do			Rock Island.
Nancy	7.5	30	0	6	5	2	0	do		2	Wilmington, N. C.
Nell	1.5	25	0	5	6	2	3	do			Cincinnati.
Norka	22	62	0	14	0	6	1	do	1	3	Portland, Me.
Olive	7	30	2	6	2	2	0	do		1	Wilmington, N. C.
Ontario		27	0	6	0	3	0	do		1	Oswego.
Oostenaula	1.2	25	0	5	6	2	5	do			Montgomery.
Ouachita	17.6	65	5	10	5	3	2	Steel	2	2	Vicksburg.
Papoose	6	30	3	7	10	4	0	Wood			Portland, Oreg.
Pathfinder	9	38	0	8	0	3	0	do		1	Baltimore.
Pearl	5	40	0	7	6	4	0	do		1	Cincinnati.
Pedrito	5	26	0	7	0	3	4	do		1	Los Angeles.
Phoenix John	1	28	0	5	0	2	3	do		1	Louisville.
Pigmy	45	54	0	2	2	3	8	do			Galveston.
Pioneer	20	35	0	8	6	4	0	do		1	Cincinnati.
Plebe	19	48	6	9	0	5	0	do	1	1	Boston.
Plover		20	0	5	9	1	0	do			Rock Island.
Polly		26	0	5	3	1	3	do			Do.
Polly	2	16	0	14	6	2	6	do		1	Wilmington, N. C.
Powhatan	7	40	2	9	9	4	8	do			Washington, D. C.
Radius	2.5	18	0	5	0	1	6	do			Savannah.
Rainbow	1	15	0	4	4	2	8	do			Norfolk.
Relee	5.3	80	0	7	6	3	1	do			Washington, D. C.
Rees, General	29	48	0	12	0	5	0	do	1	3	New Orleans.
Rock Island Rapids	4	22	0	4	0	2	0	do			Rock Island.
Salem	6.5	34	0	8	6	3	6	do	1		Portland.
Sally		26	0	5	3	1	3	do			Rock Island.
Santa Rosa	64	70	0	16	0	8	0	do	1	3	Montgomery.
Schuylkill	16	54	0	12	0	3	6	do	1	2	Philadelphia.
Schuyler	1.2	25	0	5	8	1	10	do			New York.
Scorpion	1.5	23	0	7	0	4	0	do			Philadelphia.
Sergeant Burke	5	35	0	8	6	3	6	do			Wheeling.
Sextant	2	27	0	6	0	4	0	do			Dallas.
Shad		26	0	5	3	1	3	do			Rock Island.
Sharpie	7	48	0	8	6	4	0	do			Charleston.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS H.—LAUNCHES—Continued.

Name, number, or letter.	Displacement.	Dimensions.			Material.	Complement.		District.
		Length.	Beam.	Depth.		Officers.	Men.	
	Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*				
Sheppard, Morris	5	35 0	7 6	3 0	Wood		2	Dallas.
Sioux		20 0	8 0	2 3	Steel			Kansas City.
Snapshot	1	18 0	6 0	3 6	Wood	1	1	Galveston.
Snipe		20 0	6 4	2 0	do			Rock Island.
Sparrow		20 0	5 10	1 7	do			Do.
Spray	14	45 0	11 0	4 6	do			Savannah.
Spry	1	20 0	6 0	3 6	do	1	1	Galveston.
Spry	2	16 0	5 4	3 8	do		1	Wilmington, N. C.
Stadia	5	30 3	6 6	2 7	do			New Orleans.
Stewart	1.5	28 0	6 6	2 6	do			St. Louis.
Swallow		20 0	5 10	1 7	do			Rock Island.
Swift		20 0	5 10	1 7	do			Do.
Tangent	13	41 0	8 6	3 7	do			Duluth.
Thom, Gen. Geo	24	73 0	12 5	4 6	do			Wilmington.
Titania		27 0	4 0	2 0	do			Memphis.
Transit	2.5	27 0	6 0	2 5	do		1	Dallas.
Trout		26 0	5 3	1 8	do			Rock Island.
Trumbull, G. A	2	21 0	5 0	2 0	do		1	Dallas.
Vamos	5	31 0	7 0	2 2	do			Rock Island.
Victoria	3	27 0	6 0	3 0	do	1	1	Galveston.
Vigilant	22	63 11	11 6	7 8	do	1	1	Portland.
Violetta	8	31 0	11 4	4 4	do		1	Jacksonville.
Viper		28 0	4 6	2 6	do			Rock Island.
"W"		16 4	4 8	0 10	do			New York.
Wah-ta-wah		80 0	15 0	5 2	do	2	2	Do.
Warren, Gen	38.19	72 2	17 0	5 0	do			Washington.
Wasp		22 0	5 0	0 8	do			Rock Island.
Wee Tee	.5	16 0	4 0	1 4	do		1	Charleston.
Wenonah	32	65 0	8 0	5 0	do	1	2	Pittsburgh.
Winyaw	4.5	30 0	6 0	3 6	do		1	Charleston.
Wolf	18	31 0	9 6	2 8	do	1	5	Mobile.
Wren		26 0	5 3	1 3	do			Rock Island.
Yawl		26 0	5 3	1 3	do			Do.
No. 1	1	25 0	5 6	4 0	do			Detroit.
No. 1	27	75 0	15 0	2 6	do			Nashville.
No. 1		14 0	4 0	2 6	do			Wilmington, Del.
No. 2	2	20 0	5 3	2 6	Steel			Chattanooga.
No. 3	3	22 0	6 0	2 4	Wood			Do.
No. 3, U. S. L. S	2.6	22 0	6 0	3 0	do			Detroit.
No. 4	6	23 0	6 9	4 5	do			Chattanooga.
No. 4, U. S. L. S	10	32 11	9 10	4 6	do			Detroit.
No. 5		19 2	4 3	2 7	do			Chattanooga.
No. 5, U. S. L. S	18	32 6	9 0	4 0	do			Detroit.
No. 6	4	24 0	6 0	3 6	do			Chattanooga.
No. 6, U. S. L. S	10	32 6	9 0	4 0	do			Detroit.
No. 7	3	28 0	4 0	3 0	do			Chattanooga.
No. 7, U. S. L. S	2.2	22 4	6 6	3 0	do			Detroit.
No. 1 Inspector	3	25 0	4 6	2 6	Steel			Little Rock.

CLASS I.—MANEUVER BOATS.

No. 1	15	45 10	16 0	3 4	Wood			Dallas.
No. 1	79	50 0	20 0	3 4	do			Cincinnati.
No. 2	79	50 0	20 0	3 4	do			Do.
No. 3	123	60 0	26 0	3 4	do			Do.
No. 10, U. S. E. Wheeling.	60	60 0	22 0	3 8	do			Wheeling.
No. 11, U. S. E. Wheeling.	60	60 0	22 0	3 8	do			Do.
No. 22	60	60 0	22 0	3 8	do			Do.
No. 23	60	60 0	22 0	3 8	do			Do.
No name	38	55 0	17 0	3 0	do			Pittsburgh.
Do	41	56 0	18 0	3 0	do			Do.
Do	41	56 0	18 0	3 0	do			Do.
Do	70	60 0	22 0	3 8	do			Do.
Do	54	60 0	22 0	3 8	do			Do.
Do	58	60 0	22 0	3 8	do			Do.
Do	65	60 0	22 0	3 8	do			Do.
Do	71	75 0	22 0	3 3	do			Cincinnati.
Do	65	60 0	22 0	3 8	do			Pittsburgh.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS J.—DERRICK BOATS.

Name, number, or letter.	Displacement.	Dimensions.			Material.	Complement.		District.
		Length.	Beam.	Depth.		Officers.	Men.	
	Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*				
A	34	55 0	18 0	3 0	Wood			Nashville.
Black	51	45 0	20 0	3 9	...do	1	7	Wilmington, N. C.
C	29	42 6	32 0	3 6	...do			Mobile.
Derrick "A"	110	80 0	28 0	4 0	...do			Charleston, S. C.
Lilliput	82	60 0	24 0	5 1	...do		6	Wilmington, N. C.
Mary Ann	161	115 0	28 10	3 0	...do			Pittsburgh.
Ohio No. 1	110	71 0	30 0	4 0	...do			Do.
Rattler	240	70 0	30 0	7 0	...do	2	9	Philadelphia.
No. 1	115	65 0	27 0	5 6	...do	1	14	Galveston.
No. 1-G. & B	76	70 0	28 0	4 0	...do			Louisville.
No. 1	73	66 6	29 6	5 10	...do			Milwaukee.
Do	70	70 0	28 0	4 0	...do			Nashville.
Do	135	100 0	30 0	3 6	...do			New Orleans.
Do	78	63 0	24 0	5 0	...do			Do.
Do	80	74 0	28 0	5 0	...do	2	6	Oswego, N. Y.
Do	47	48 0	22 0	3 9	...do			Pittsburgh.
Do	84	70 0	30 0	4 0	...do	1	9	Portland, Ore.
Do	96	60 0	20 0	6 0	...do			Savannah.
Do	75	68 0	20 0	3 1	...do			St. Louis.
Do	105	95 0	32 0	2 6	...do			Vicksburg.
Do	118	72 0	22 0	6 0	...do			Washington D. C.
No. 2	65	64 0	22 0	7 0	...do		10	Galveston.
Do	61	60 0	28 0	4 0	...do			Little Rock.
No. 2-G. & B	76	70 0	28 0	4 0	...do			Louisville.
No. 2	122	74 0	36 0	6 0	...do			Manila.
Do.[1]	111	84 2	27 4	6 8	...do			Milwaukee.
Do	70	70 0	28 0	4 0	...do			Nashville.
Do	135	100 0	30 0	3 6	...do			New Orleans.
Do		76 0	28 0	6 3	...do	1	1	Oswego, N. Y.
Do	70	70 0	28 0	3 8	...do			Pittsburgh.
Do	75	68 0	20 0	3 1	...do			St. Louis.
Do	54	65 0	24 0	3 6	...do			Vicksburg.
Do	130	70 6	32 0	4 0	...do			Wheeling.
No. 3	74	80 0	24 0	4 6	...do			Chattanooga.
Do	45	54 0	22 0	3 8	...do		9	Galveston.
No. 3-G. & B	76	70 0	28 0	4 0	...do			Louisville.
No. 3	177	75 0	30 0	5 0	...do			Memphis.
Do	44	80 0	20 0	4 9	...do			Milwaukee.
Do	100	80 0	30 0	4 2	...do			Nashville.
Do	104	70 0	28 0	3 6	...do			Pittsburgh.
Do	95	70 6	30 7	4 6	...do		2	Wheeling.
No. 4	75	80 0	30 0	3 0	...do			Chattanooga.
Do	20	29 6	10 0	3 10	...do			Los Angeles.
Do	44	80 0	20 0	4 9	...do			Milwaukee.
No. 5	250	100 0	34 0	6 10	...do			Chattanooga.
No. 5—L. P. C	57	72 0	22 0	4 0	...do			Louisville.
No. 5	105	75 6	28 6	7 0	...do			Manila.
Do	50	38 0	18 0	6 0	...do			Philadelphia.
No. 6	60	100 0	20 0	3 0	...do			Chattanooga.
No. 7	85	80 0	30 0	3 6	...do			Do.
No. 9		150 0	36 0	8 9	...do	4	3	Oswego, N. Y.
No. 12		100 0	32 0	9 4	...do	2	3	Do.
No. 24	161	75 0	35 0	4 10	...do		3	Wheeling.
No. 319		70 0	28 0	4 0	...do	1	4	Rock Island.

CLASS K.—PILE DRIVERS.

Name, number, or letter.	Displacement.	Length.	Beam.	Depth.	Material.	Officers.	Men.	District.
A	25	45 3	17 0	3 6	Wood			Savannah.
No. 1, G. R		40 0	20 0	3 0	...do			Grand Rapids.
No. 1		76 0	19 0	4 6	...do			Kansas City.
No. 1-B		56 0	18 0	4 0	...do			Do.
No. 1[2]	22	66 4	21 4	6 6	...do			Milwaukee.
No. 1		81 0	22 0	4 0	...do			Montgomery.
Do	71	55 0	25 0	4 0	...do			New Orleans.
Do	68	50 0	28 0	3 6	...do			Pittsburgh.
Do	20	45 3	17 0	3 6	...do			Savannah.
Do	75	68 0	20 0	3 1	...do			St. Louis.
No. 2	82	60 0	25 4	6 6	...do			Milwaukee.
Do	14	40 0	18 0	3 0	...do			Montgomery.

[1] With concrete mixer.

[2] Without pile driver.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS K.—PILE DRIVERS—Continued.

Name, number, or letter.	Displacement.	Dimensions.			Material.	Complement.		District.
		Length.	Beam.	Depth.		Officers.	Men.	
	Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*				
No. 2[1]	127	75 6	30 0	5 0	Wood			New Orleans.
No. 2	51	50 0	26 0	3 6	...do			Pittsburgh.
Do	50	53 5	20 1	3 10	...do			Washington.
No. 3	8.8	30 0	16 0	2 0	...do			Montgomery.
Do		50 6	20 9	3 3	...do			Pittsburgh.
Do	75	68 0	20 0	3 1	...do			St. Louis.
No. 4[1]	65	65 0	30 0	4 4	...do			Cincinnati.
No. 4	56	57 0	24 0	3 6	...do			Duluth.
Do	17.5	40 0	18 0	3 0	...do			Montgomery.
Do	75	68 0	20 0	3 1	...do			St. Louis.
No. 5[1]	55	60 0	26 0	3 0	...do			Cincinnati.
No. V-S		65 0	19 0	4 6	...do			Kansas City.
No. 5	17.5	40 0	18 0	3 0	...do			Montgomery.
Do	75	68 0	20 0	3 1	...do			St. Louis.
No. 6[1]	50	50 0	28 0	3 10	...do			Cincinnati.
No. 6	68	58 0	20 0	6 0	...do			Manila.
Do	57	70 0	20 0	3 0	...do			Memphis.
No. VII-Y		60 8	18 0	4 0	...do			Kansas City.
No. 9	57	70 0	20 0	3 0	...do			Memphis.
No. 12	75	68 0	20 0	3 1	...do			St. Louis.
No. 15		76 3	18 4	4 4	...do			Kansas City.
No. 17	17.5	40 0	18 0	3 0	...do			Montgomery.
No. 25	75	68 0	20 0	3 1	...do			St. Louis.
No. 26	17.5	40 0	18 0	3 0	...do			Montgomery.
Do	75	68 0	20 0	3 1	...do			St. Louis.
No. 28	75	68 0	20 0	3 1	...do			Do.
No. 29	75	68 0	20 0	3 1	...do			Do.
No. 30	75	68 0	20 0	3 1	...do			Do.
No. 31	75	68 0	20 0	3 1	...do			Do.
No. 32	75	68 0	20 0	3 1	...do			Do.
No. 33		66 0	18 0	4 0	...do			Rock Island.
Do	75	68 0	20 0	3 1	...do			St. Louis.
No. 34	75	68 0	20 0	3 1	...do			Do.
No. 35	75	68 0	20 0	3 1	...do			Do.
No. 104		65 0	18 0	3 0	...do			Rock Island.
No name		100 0	24 0	2 0	...do			Grand Rapids.
Do		43 0	20 0	3 9	...do			New York.

CLASS L.—GRADERS.

No. 1	236	124 0	30 0	7 7	Wood			New Orleans.
No. 2	300	110 0	30 0	5 0	...do			Memphis.
No. 2	236	124 0	30 0	7 7	...do			New Orleans.
No. 579	229	120 0	30 0	6 0	...do			Vicksburg.
No. 9313	246	120 0	30 0	4 0	...do			Memphis.
IV-EP		70 0	19 10	5 0	...do			Kansas City.
Barataria[2]								New Orleans.

CLASS M.—DRILL BOATS.

Columbia River No. 1	100	100 0	26 6	4 6	Wood			Seattle.
Columbia River No. 2	100	100 0	26 6	4 6	...do			Do.
Columbia River No. 3	100	100 0	26 6	4 6	...do			Do.
Hudson		71 0	24 0	7 0	...do			New York.
Newton, Gen. John	750	127 0	58 0	9 6	...do			Philadelphia.
No. 6		80 0	20 0	4 0	...do	2	22	Rock Island.
No. 16	60	68 0	68 0	5 0	...do	1	20	Montgomery.
No. 34		68 0	18 0	4 0	...do	1	1	Rock Island.
No. 103		81 0	18 0	4 0	...do	2	18	Do.

CLASS N.—QUARTER BOATS.

A		72 0	20 0	2 6	Wood			Kansas City.
Do	34	45 0	24 0	5 0	...do			Mobile.
Alpha		79 6	20 6	3 6	...do			New Orleans.

[1] Combination pile driver and derrick.

[2] See bucket and dipper dredges.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS N.—QUARTER BOATS—Continued

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
B		72	0	20	0	2	6	Wood			Kansas City.
Do	33	60	0	20	0	3	4	...do			Mobile.
Baton Rouge	198	140	0	30	4	4	0	...do			New Orleans.
Bayou Goula	198	140	0	30	4	4	0	...do			Do.
Bayou Sara	198	140	0	30	4	4	0	...do			Do.
C-1	37	70	0	20	0	3	7	...do			Grand Rapids.
Caney Fork		65	0	14	0	2	6	...do			Nashville.
Gamma		131	0	31	6	3	4	...do			New Orleans.
Hay Lake	106	70	0	22	0	4	4	...do			Detroit.
Illinois	72	107	6	27	2	4	6	...do			St. Louis.
Lake Borgne	68	80	0	22	0	4	4	...do			New Orleans.
La Salle (No. 232)		100	0	20	0	4	3	...do			Rock Island.
Margaret	30	100	0	26	0	4	3	...do			Chicago.
Natchez	198	140	0	30	0	4	0	...do			New Orleans.
New Orleans	237	166	0	30	0	4	3	...do			Do.
Observer	25	50	0	20	0	0	10	...do	7	10	Philadelphia.
Port Hudson	68	80	0	22	0	4	4	...do			New Orleans.
Sangamon (No. 231)		100	0	20	0	4	3	...do			Rock Island.
Skidaway	27	51	6	11	0	4	0	...do			Savannah.
St. Joseph	198	140	0	30	4	4	0	...do			New Orleans.
Thronateeska	96	75	0	26	0	4	7	...do	2	10	Montgomery.
Torros	68	80	0	22	0	4	4	...do			New Orleans.
No. 1	26	51	0	15	0	2	10	...do			Charleston.
Do	20	60	0	16	0	3	0	...do			Chattanooga.
Do	12	52	0	16	0	3	10	...do			Chicago.
No. 1, Cypress Bayou	20	60	0	16	0	3	0	...do	1	10	Dallas.
No. 1, Neches River	27	60	0	16	0	4	0	...do		2	Do.
No. 1, Red River	24	60	0	22	0	3	0	...do	1	18	Do.
No. 1, Sulphur River	24	60	0	22	0	3	0	...do	1	18	Do.
No. 1, Trinity River	24	60	0	22	0	3	0	...do	1	18	Do.
No. 1	80	60	8	23	7	7	6	...do			Galveston.
Do		100	0	20	0	5	0	...do			Kansas City.
Do	104	100	0	20	0	4	0	...do			Little Rock.
No. 1, G. & B	76	76	0	24	0	3	6	...do			Louisville.
No. 1, Ohio	88	110	0	22	0	3	6	...do			Do.
No. 1, Wabash	20	46	6	16	1	2	6	...do			Do.
No. 1	37	90	0	20	0	4	0	...do			Milwaukee.
Do	23	50	0	20	0	3	7	...do			Montgomery.
Do	44	85	0	22	0	3	6	...do			Pittsburgh.
Do	120	90	0	26	0	4	0	...do			Portland, Oreg.
Do	130	135	0	30	0	3	11	...do			St. Louis.
Do	64	80	2	19	1	4	2	...do			Washington.
No. 2	5	26	6	10	0	2	8	...do			Charleston.
Do	38	85	0	18	0	3	0	...do			Chattanooga.
No. 2, Red River	24	60	0	22	0	3	0	...do	1	18	Dallas.
No. 2, Trinity River	24	60	0	22	0	3	0	...do	1	18	Do.
No. 2, Ohio	138	125	6	30	0	4	6	...do			Louisville.
No. 2, Wabash	22	57	6	16	4	3	0	...do			Do.
No. 2	25	70	0	18	3	3	6	...do			Milwaukee.
Do	23	50	0	20	0	3	7	...do			Montgomery.
Do	29.8	76	0	16	0	3	0	...do			Pittsburgh.
Do	130	135	0	30	0	3	11	...do			St. Louis.
Do	36	48	0	16	0	3	6	...do			St. Paul.
Do	25.6	59	6	15	6	3	0	...do			Vicksburg.
No. 3	2	22	0	8	4	1	9	...do			Charleston.
Do	20	65	0	16	0	3	0	...do			Chattanooga.
No. 3, Trinity River	20	54	0	18	0	3	0	...do	1	18	Dallas.
No. 3	88	110	0	22	0	3	6	...do			Louisville.
Do	26	60	0	16	0	2	0	...do			Montgomery.
Do	130	135	0	30	0	3	11	...do			St. Louis.
Do	39	52	0	16	0	3	5	...do			St. Paul.
Do	25.6	59	6	15	6	3	0	...do			Vicksburg.
No. 4	88	110	0	22	0	3	6	...do			Louisville.
Do	48	70	0	21	6	3	0	...do	2	50	Montgomery.
Do	130	135	0	30	0	3	11	...do			St. Louis.
No. 5	25	64	0	16	0	3	0	...do			Chattanooga.
Do	130	135	0	30	0	3	11	...do			St. Louis.
Do	34	68	3	18	0	3	5	...do			Vicksburg.
No. 6	20	65	0	16	0	3	0	...do			Chattanooga.
Do	130	135	0	30	0	3	11	...do			St. Louis.
No. 7	55	106	0	21	0	3	0	...do			Chattanooga.
Do	130	135	0	30	0	3	11	...do			St. Louis.
No. 8	27	67	0	16	0	3	0	...do			Chattanooga.
Do	125	135	0	25	0	8	0	...do			Memphis.
Do	130	135	0	30	0	3	11	...do			St. Louis.
No. 9	50	104	0	20	0	3	6	...do			Chattanooga.

TABLE V.—*Alphabetical list, by classes, of floating plant owned by the Engineer Department*—Continued.

CLASS N.—QUARTER BOATS—Continued.

Name, number, or letter.	Displacement.	Dimensions.						Material.	Complement.		District.
		Length.		Beam.		Depth.			Officers.	Men.	
	Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*				
No. 9	130	135	0	30	0	3	11	Wood			St. Louis.
Do	34	68	0	18	0	4	0	...do			Vicksburg.
No. 10	57	105	0	21	0	3	9	...do			Chattanooga.
Do	22	75	0	14	0	1	9	...do			Cincinnati.
Do	130	135	0	30	0	3	11	...do			St. Louis.
Do	34	68	0	18	0	4	0	...do			Vicksburg.
No. 11	50	100	0	20	0	4	0	...do			Chattanooga.
Do	40	90	0	18	0	3	6	...do			Cincinnati.
Do	125	135	0	25	0	8	0	...do			Memphis.
Do		75	0	20	0	3	0	...do			Rock Island.
Do	34	68	0	18	0	4	0	...do			Vicksburg.
No. 12	43	80	0	20	0	4	0	...do			Chattanooga.
Do	25	78	0	11	0	4	0	...do			Cincinnati.
Do	125	135	0	25	0	8	0	...do			Memphis.
Do	20	45	0	16	0	3	0	...do			Vicksburg.
No. 14	50	100	0	20	0	4	0	...do			Chattanooga.
Do		70	0	16	0	4	0	...do			Rock Island.
No. 15	48	100	0	20	0	3	3	...do			Chattanooga.
No. 16	50	100	0	20	0	3	0	...do			Do.
No. 17	48	100	0	20	0	3	3	...do			Do.
Do		70	0	24	0	3	0	...do			Rock Island.
Do	89	85	0	23	0	3	0	...do			Vicksburg.
No. 25	125	135	0	25	0	8	0	...do			Memphis.
Do	120	80	0	29	0	5	0	...do			Montgomery.
No. 26	125	135	0	25	0	8	0	...do			Memphis.
No. 27	43	90	6	18	6	3	0	...do			Do.
No. 29, Amelia	43	90	6	18	6	3	0	...do			Do.
No. 45		74	0	16	0	3	0	...do			Rock Island.
No. 47		75	0	20	0	3	0	...do			Do.
No. 52		58	0	18	0	3	6	...do			Do.
No. 65		40	0	16	0	2	0	...do			Do.
No. 71		75	0	20	0	3	0	...do			Do.
No. 75		75	0	20	0	3	6	...do			Do.
No. 86	87	100	0	28	0	5	0	...do			Vicksburg.
No. 87	87	100	0	28	0	5	0	...do			Do.
No. 88	107	120	0	28	0	6	0	...do			Do.
No. 91		50	0	12	0	3	0	...do			Rock Island.
No. 92		81	0	16	0	3	0	...do			Do.
No. 94		35	0	18	0	3	0	...do			Do.
No. 118		70	0	20	0	3	0	...do			Do.
No. 121		52	0	16	0	2	6	...do			Do.
No. 122		52	0	16	0	2	6	...do			Do.
No. 123		52	0	16	0	2	6	...do			Do.
No. 124		52	0	16	0	2	6	...do			Do.
No. 131	186	131	0	30	0	5	0	...do			Vicksburg.
No. 155	107	120	0	28	0	6	0	...do			Do.
No. 156	107	120	0	28	0	6	0	...do			Do.
No. 157	107	120	0	28	0	6	0	...do			Do.
No. 158	107	120	0	28	0	6	0	...do			Do.
No. 159	107	120	0	28	0	6	0	...do			Do.
No. 183		100	0	20	0	3	0	...do			Rock Island.
No. 184		60	0	18	0	3	0	...do			Do.
No. 202		70	0	20	0	3	0	...do			Do.
No. 206	130	120	0	30	0	6	0	...do			Memphis.
No. 221	130	120	0	30	0	6	0	...do			Do.
No. 237		68	0	22	0	3	0	...do			Rock Island.
No. 262		66	0	22	0	3	0	...do			Do.
No. 301		75	0	20	0	4	0	...do			Do.
No. 342-a		80	0	20	0	3	0	...do			Do.
No. 342		80	0	20	0	3	0	...do			Do.
No. 343		75	0	20	0	3	0	...do			Do.
No. 346		80	0	20	0	3	0	...do			Do.
No. 347		80	0	20	0	3	0	...do			Do.
No. 348		80	0	20	0	3	0	...do			Do.
No. 412		82	0	20	0	3	0	...do			Do.
No. 0601	30	68	0	18	0	4	0	...do			Memphis.
No. 1010	177	135	0	34	0	5	0	...do			Vicksburg.

CLASS O.—FLOATING DRY DOCKS.

Name, number, or letter.	Displacement.	Length Ft.	in.	Beam Ft.	in.	Depth Ft.	in.	Material.	Officers.	Men.	District.
No. 1015	384	156	0	54	6	4	9	Steel			Vicksburg.
No name		145	0	36	0	10	0	Wood			Memphis.
Do		104	0	30	0	9	6	...do			New Orleans.

TABLE VI.

COMPLETE LIST OF FLOATING PLANT, BY DISTRICTS.

TABLE VI.—*Statement of floating plant owned by the United States*

[NOTE.—Length given between perpendiculars.]

BALTIMORE, MD.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Sentinel	Tugboat	170.00	90 6	19 0	9 6	1897	Baltimore, Md
Pathfinder	Gasoline boat	10.00	38 0	8 0	3 0	1909	do

BOSTON, MASS.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Col. Harwood[1]	Class E, tug and survey boat, screw, steam.	107.00	75 2	16 3	9 7	1898	South Portland, Me.
Executive	Class G, steam lighter	236.00	86 3	20 0	8 5	1901	Essex, Mass
Plebe	Class H, gasoline motor launch.	19.00	48 6	9 0	5 0	1899	Boston, Mass
No. 1	Scow (survey)	18.00	55 0	12 0	3 2	1910	do
No. 2	do	18.00	55 0	12 0	3 2	1910	do
No. 3	do	18.00	55 0	12 0	3 2	1911	Chelsea, Mass
No. 4	do	18.00	55 0	12 0	3 2	1911	do

BUFFALO, N. Y.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Gwendolen	Steam launch	8.00	28 0	8 0	4 6	1900	Erie, Pa
Thomas Lincoln Casey.	Steam tug	90.00	60 0	15 0	8 0	1898	Toledo, Ohio
Dunkirk	Gasoline launch	.75	24 6	6 8	3 0	1906	Dunkirk, N. Y
Gemini	Catamaran sounding scow.	70.00	120 0	30 0	3 0	1897	Buffalo, N. Y

CHARLESTON, S. C.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Sumter	Seagoing hopper dredge.	1,706.22	198 5	41 0	21 0	1904	Petersburg, Va
Charleston	do	800.00	122 6	30 0	12 0	1891	Brooklyn, N. Y
Winyah Bay	do	831.00	141 0	31 6	13 0	1898	Wilmington, Del
Congaree	Hydraulic pipe line dredge.	250.00	110 10	32 6	2 6	1908	Georgetown, S. C
Cheraw	Dipper dredge	620.00	150 0	28 0	6 0	1905	Wilmington, Del
Dredge No. 1	Bucket dredge	375.00	90 0	30 0	7 0	1892	Georgetown, S. C
Wateree	Steam hoister	100.00	100 0	25 0	5 6	1907	do
Great Pedee	do	188.00	100 0	25 0	5 6	1906	do
Socastee	do	18.00	41 0	12 0	4 0	1908	do
Derrick A	do	110.00	80 0	28 0	4 0	1907	Columbia, S. C

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[1] Formerly Mina and Lizzie.

and employed in the Engineer Department at Large on June 30, 1911.

[NOTE.—Length given between perpendiculars.]

BALTIMORE, MD.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1897	Baltimore, Md.	Steel.	$24,497.00	$18,000.00	Good.	All works in district.	Improving harbor, Baltimore, Md.
1909	Built by Engineer Department employees.	Wood.	1,360.00	1,000.00	do	do	Do.

BOSTON, MASS.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1906	Portland, Me.	Wood.	[2] $9,800.00	$9,000.00	Good.	Boston Harbor, Mass.	Boston Harbor, Mass.
		do	19,450.00	9,000.00	do	do	Gun and mortar batteries.
		do	6,500.00	1,400.00	do	Boston Harbor and vicinity.	Boston Harbor, one-half part; Plymouth Harbor, one-fourth; Mystic River, one-fourth.
		do	1,349.00	1,300.00	do	Boston Harbor, Mass.	Boston Harbor, Mass.
		do	1,349.00	1,300.00	do	do	Do.
		do	1,237.50	1,200.00	New.	do	Do.
		do	1,237.50	1,200.00	do	do	Do.

BUFFALO, N. Y.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1900	Erie, Pa.	Wood.	$1,800.00	$1,200.00	Good.	Erie, Pa.	Improving harbor, Erie, Pa.
1898	Toledo, Ohio.	Steel.	11,970.00	7,500.00	do	Buffalo, N. Y.	Improving harbor, Buffalo, N. Y.
1906	Dunkirk, N, Y.	Wood.	200.00	100.00	do	Black Rock Harbor, N. Y.	Improving harbor, Dunkirk, N. Y.
1897	Buffalo, N. Y.	do	1,800.00	800.00	do	Buffalo, N. Y.	Improving harbor, Buffalo, N. Y.

CHARLESTON, S. C.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$191,560.00	$125,000.00	Good.	Charleston Harbor, S. C.	Improving harbor, Charleston, S. C.
		do	65,000.00	40,000.00	do	do	Do.
		do	73,800.00	40,000.00	do	do	Improving Winyah Bay, S. C.
		do	30,200.00	20,000.00	do	Congaree River, S. C.	Improving Santee, Wateree, and Great Pedee Rivers, S. C.
		Steel.	45,500.00	25,000.00	Fair.	Waccamaw River, N. C. and S. C.	Improving Great Pedee River, S. C.
		Wood.	18,000.00	4,000.00	do	Laid up at Smithville, S. C.	Improving Santee River, S. C.
		do	9,404.00	2,500.00	Useless.	Dismantled; hull beached.	Improving Wateree River, S. C.
		do	4,070.00	000.00	do	Dismantled; hull sunk at Smithville, S. C.	Improving Santee River, S. C.
		do	200.00	500.00	Fair.	Georgetown, S. C.	Improving Winyah Bay, S. C.
		do	5,988.22	4,800.00	Good.	Congaree River, S. C.	Improving Congaree River, S. C.

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[2] After purchase this boat was altered and repaired to such extent that its original cost in its present form was about $14,000.

TABLE VI.—*Statement of floating plant owned by the United States and*

CHARLESTON, S. C.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions. Length.		Beam.		Depth.		Built. When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Dawho	Gasoline launch	25.00	60	0	13	0	8	0	1909	City Island, N. Y.
Louise	do	13.00	40	0	10	0	5	0	1903	Mount Pleasant, S.C.
Winyah	Kerosene launch	4.50	30	0	6	0	3	6	1891	Morris Heights, N.Y.
Columbia	Gasoline launch	2.20	30	0	6	0	1	11	1908	Charleston, S. C.
Merry Widow	do	1.20	28	0	5	6	2	0	1907	Georgetown, S. C.
Wee Tee	do	.50	16	0	4	0	1	4	1909	do
No. 1	Quarter boat	26.00	51	0	15	0	2	10	1907	do
No. 2	do	5.00	26	6	10	0	2	8	1908	do
No. 3	do	2.00	22	0	8	4	1	9	1907	do
No. 1	100-ton lighter, deck	100.00	72	6	22	0	6	0	1907	Charleston, S. C.
No. 2	75-ton lighter, deck	75.00	60	6	19	6	6	0	1903	do
No. 3	do	75.00	60	4	20	0	6	6	1903	do
No. 4[1]	35-ton lighter, deck	35.00	73	0	15	0	3	6	1903	Georgetown, S. C.
No. 5[2]	6-ton lighter, deck	6.00	30	6	12	6	2	7	(3)	do
No. 6	70-ton lighter, deck	70.00	70	0	22	0	6	0	1907	Charleston, S. C.
No. 7	75-ton lighter, deck	75.00	60	6	19	6	6	0	1903	do
A	70-ton lighter, deck	70.00	70	0	22	0	4	0	1904	Columbia, S. C.
B	do	70.00	70	0	22	0	4	0	1904	do
D	do	70.00	70	0	22	0	4	0	1908	do
E[4]	30-ton lighter, deck	30.00	40	0	14	0	3	0	1908	do

CHATTANOOGA, TENN.

Name or number.	Class and description.	Displacement.	Length. Ft.	in.	Beam. Ft.	in.	Depth. Ft.	in.	When.	Where.
Colbert	Stern-wheel towboat	185.00	142	0	25	6	4	6	1891	Jeffersonville, Ind.
Col. W. R. King	do	37.00	68	4	15	6	3	0	1896	Muscle Shoals Canal.
Lookout	do	180.00	116	0	24	0	3	6	1896	Jeffersonville, Ind.
McPherson	do	113.00	115	0	21	9	3	10	1888	Nashville, Tenn.
Chilhowee	do	104.00	100	0	20	0	3	0	1908	Jeffersonville, Ind.
Hiwassee	do	104.00	100	0	20	0	3	0	1908	do
White Oak	Gasoline towboat	75.00	90	0	18	0	3	0	1905	do
Niota	do	25.00	70	0	14	0	3	0	1911	Knoxville, Tenn.
No. 2	Gasoline launch	2.00	20	0	5	3	2	6	......	Not known

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[1] Formerly stern-wheel steamer Woodboat.
[2] Sunk and abandoned; raised by Government from Waccamaw River in 1907.
[3] Unknown.
[4] Formerly boat service.

employed in the Engineer Department at Large on June 30, 1911—Continued.

CHARLESTON, S. C.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1910	Rochester, N. Y.	Wood.	$8,000.00	$8,000.00	Good..	Charleston Harbor, S. C.	Improving harbor, Charleston, S. C.; Winyah Bay, Great Pedee, Waccamaw, and Little Pedee Rivers, and waterways between Charleston and Alligator Creek, S. C.
		...do...	3,500.00	2,500.00	...do...	Georgetown S. C.	Improving harbor, Charleston, S. C.
1891	New York	...do...	1,700.00	200.00	Poor..	Laid up at Smithville, S.C.	Improving Winyah Bay, S. C.
		...do...	350.00	75.00	...do...	Congaree River, S. C.	Do.
		...do...	450.00	400.00	Good..	Waccamaw River, N. C. and S. C.	Improving Waccamaw River, N. C. and S. C.
		...do...	175.00	75.00	...do...	Congaree River, S. C.	Improving Great Pedee River, S. C.
		...do...	Unknown.	200.00	Fair...	Georgetown, S. C.	Improving Winyah Bay, S. C.
		...do...	Unknown.	75.00	...do...	Waccamaw River, N. C. and S. C.	Improving Waccamaw River, N. C. and S. C.
		...do...	Unknown.	75.00	...do...	.....do	Do.
		...do...	1,947.00	500.00	...do...	.....do	Fortification works.
		...do...	800.00	400.00	...do...	.....do	Do.
		...do...	800.00	550.00	...do...	.....do	Do.
		...do...	1,500.00	50.00	Poor..	Laid up at Smithville, S.C.	Improving Great Pedee River, S. C.
		...do...	Unknown.	150.00	Good..	Waccamaw River, N. C. and S. C.	Improving Waccamaw River, N. C. and S. C.
		...do...	1,947.00	500.00	Fair...	Charleston Harbor, S. C.	Fortification works.
		...do...	1,000.00	500.00	...do...	.....do	Do.
		...do...	800.00	100.00	Poor..	Congaree River, S. C.	Improving Congaree River, S. C.
		...do...	800.00	100.00	...do...	.....do	Do.
		...do...	900.00	350.00	Fair...	.....do	Do.
		...do...	400.00	200.00	Good..	.....do	Operating and care of canals, etc., for Congaree River, S. C.

CHATTANOOGA, TENN.

		Wood.	$9,500.00	[5] $10,500.00	Good..	Tennessee River.	Works of river improvement, Chattanooga district.
		...do...	1,300.00	[6] 5,000.00	...do...	Muscle Shoals Canal.	Do.
		...do...	9,000.00	[6] 16,000.00	...do...	Tennessee River.	Do.
		...do...	3,300.00	[7] 3,236.00	Unserviceable.	Colbert Shoals Canal.	Do.
		...do...	9,616.92	7,000.00	Fair...	Hiwassee River..	Do.
		...do...	9,616.92	8,000.00	Good..	Tennessee River.	Do.
1908	Decatur, Ala.	...do...	2,500.00	3,000.00	Poor..	.....do	Do.
		...do...	3,255.00	3,255.00	Good..	French Broad River.	Do.
1907	Detroit, Mich.	Steel..	525.00	446.00	...do...	Tennessee River.	Do.

[5] Rebuilt in 1909; extensively repaired in 1911.
[6] Rebuilt in 1911.
[7] Hull and cabin condemned; new hull and cabin under construction.

TABLE VI.—*Statement of floating plant owned by the United States and*

CHATTANOOGA, TENN.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions. Length.		Dimensions. Beam.		Dimensions. Depth.		Built. When.	Built. Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 3	Gasoline launch	3.00	22	0	6	0	2	4	1908	Knoxville, Tenn
No. 4	do	6.00	23	0	6	9	4	5	1908	do
No. 6	do	4.00	24	0	6	0	3	6	1909	Muscle Shoals Canal
No. 7	do	3.00	28	0	4	0	3	0	1909	do
Kentucky	Dipper dredge (nonpropelling).	326.00	100	0	34	0	6	10	1900	Paducah, Ky
Kwasind	do	187.00	80	0	28	0	6	6	1899	Knoxville, Tenn
Alabama	Dredge (wet conveyor, nonpropelling).	244.00	80	0	38	0	6	0	1891	Bucyrus, Ohio (machinery); Chattanooga, Tenn. (hull).
Tennessee	Dipper dredge (nonpropelling).	375.00	100	0	34	0	6	10	1910	Muscle Shoals Canal (hull); South Milwaukee, Wis. (machinery).
Pump boat	10-inch suction	113.00	90	0	24	0	3	6	1910	Muscle Shoals Canal
No. 1	Quarter boat	20.00	60	0	16	0	3	0	1893	Kingston, Tenn
No. 2	do	38.00	85	0	18	0	3	0	1896	do
No. 3	do	20.00	65	0	16	0	3	0	1888	Chattanooga, Tenn
No. 5	do	25.00	64	0	16	0	3	0	1902	Knoxville, Tenn
No. 6	do	20.00	65	0	16	0	3	0	1902	do
No. 7	do	55.00	106	0	21	0	3	0	1902	do
No. 8	do	27.00	67	0	16	0	3	0	1893	Chattanooga, Tenn
No. 9	do	50.00	104	0	20	0	3	6	1907	Muscle Shoals Canal
No. 10	do	57.00	105	0	21	0	3	9	1908	do
No. 11	do	50.00	100	0	20	0	4	0	1908	do
No. 12	do	43.00	80	0	20	0	4	0	1897	do
No. 14	do	50.00	100	0	20	0	4	0	1909	do
No. 15	do	48.00	100	0	20	0	3	3	1909	do
No. 16	do	50.00	100	0	20	0	3	0	1909	do
No. 17	do	48.00	100	0	20	0	3	3	1909	do
No. 3	Derrick boat	74.00	80	0	24	0	4	6	1904	do
No. 4	do	75.00	80	0	30	0	3	0	1896	Knoxville, Tenn
No. 5[3]	do	250.00	100	0	34	0	6	10	1908	Muscle Shoals Canal
No. 6	do	60.00	100	0	20	0	3	0	1908	Knoxville, Tenn
No. 7	do	85.00	80	0	30	0	3	6	1909	Muscle Shoals Canal
No. 1	Tool boat	30.00	65	0	16	0	3	0	1902	Knoxville, Tenn
No. 1	Blacksmith-shop boat	56.00	100	0	18	0	3	0	1908	do
No. 1	Drill tender	31.00	65	0	16	0	3	0	1902	do
No. 14	Barge	51.00	65	0	16	0	3	0	1902	do
No. 15	do	51.00	65	0	16	0	3	0	1902	do
No. 16	do	51.00	65	0	16	0	3	0	1902	do
No. 17	do	51.00	65	0	16	0	3	0	1902	do
No. 18	do	67.00	65	0	18	0	3	0	1903	do
No. 19	do	67.00	65	0	18	0	3	0	1903	do
No. 20	do	67.00	65	0	18	0	3	0	1903	do
No. 21	do	56.00	100	0	24	0	5	0	1905	Muscle Shoals Canal
No. 22	do	56.00	100	0	24	0	5	0	1905	do
No. 23	do	420.00	140	0	30	0	4	6		
No. 24	do	228.00	100	0	24	0	4	0	1908	Muscle Shoals Canal
No. 25	do	228.00	100	0	24	0	4	0	1908	do
No. 26	do	228.00	100	0	24	0	4	0	1908	do
No. 27	do	120.00	100	0	20	0	3	0	1908	Knoxville, Tenn
No. 28	do	120.00	100	0	20	0	3	0	1908	do
No. 30	do	120.00	100	0	20	0	3	0	1908	do

[1] Rebuilt in 1908; extensive repairs in 1911.
[2] Rebuilt in 1911.
[3] Hull built in 1899 (barge No. 1).

employed in the Engineer Department at Large on June 30, 1911—Continued.

CHATTANOOGA, TENN.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	......	Wood.	$740.00	$600.00	Good..	Tennessee River.	Works of river improvement, Chattanooga district.
......	......	...do...	740.00	511.00	...do...	Hiwassee River..	Do.
......	......	...do...	833.00	600.00	...do...	Tennessee River.	Do.
......	......	...do...	805.00	580.00	...do...	.....do..........	Do.
......	......	...do...	34,300.00	24,573.00	Fair...	.....do..........	Do.
......	......	...do...	11,000.00	[1] 14,725.00	Good..	.....do..........	Do.
......	......	...do...	22,500.00	10,624.00	Poor..	Muscle Shoals Canal.	Do.
......	......	...do...	37,513.00	30,600.00	Good..	Tennessee River..	Do.
1911	Nashville, Tenn.	...do...	7,000.00	7,000.00	...do...	.....do..........	Do.
......	......	...do...	1,000.00	460.00	...do...	.....do..........	Do.
......	......	...do...	800.00	374.00	...do...	Hiwassee River..	Do.
......	......	...do...	700.00	200.00	Fair...	.....do..........	Do.
......	......	...do...	935.00	465.00	Good..	Muscle Shoals Canal.	Do.
......	......	...do...	935.00	421.00	...do...	French Broad River.	Do.
......	......	...do...	1,800.00	1,430.00	...do...	Tennessee River..	Do.
......	......	...do...	850.00	[2] 1,350.00	...do...	.....do..........	Do.
......	......	...do...	2,437.00	1,280.00	...do...	.....do..........	Do.
......	......	...do...	3,257.00	2,530.00	...do...	.....do..........	Do.
......	......	...do...	2,800.00	1,792.00	...do...	.....do..........	Do.
......	......	...do...	1,000.00	80.00	Poor..	Muscle Shoals Canal.	Do.
......	......	...do...	3,279.00	2,060.00	Good..	Tennessee River..	Do.
......	......	...do...	1,785.00	[3] 280.00	Poor..	Muscle Shoals Canal.	Do.
......	......	...do...	1,785.00	[4] 250.00	...do...	Tennessee River..	Do.
......	......	...do...	1,785.00	[5] 320.00	...do ..	.....do..........	Do.
......	......	...do...	2,450.00	2,118.00	Good..	Muscle Shoals Canal.	Do.
......	......	...do...	3,325.00	1,778.00	Fair...	French Broad River.	Do.
......	......	...do...	3,946.00	2,240.00	Poor..	Tennessee River..	Do.
......	......	...do...	3,624.00	2,557.00	Fair...	Hiwassee River..	Do.
......	......	...do...	5,407.00	4,200.00	Good..	Tennessee River..	Do.
......	......	...do...	660.00	352.00	...do...	.....do..........	Do.
......	......	...do...	1,341.00	860.00	...do...	.....do..........	Do.
......	......	...do...	600.00	450.00	Poor..	Hiwassee River..	Do.
......	......	...do...	550.00	330.00	...do...	.....do..........	Do.
......	......	...do...	550.00	80.00	...do...	Tennessee River..	Do.
......	......	...do...	550.00	....	Worthless.	French Broad River.	Do.
......	......	...do...	550.00	330.00	Poor..	Hiwassee River..	Do.
......	......	...do...	600.00	400.00	...do...	.....do..........	Do.
......	......	...do...	600.00	280.00	...do...	French Broad River.	Do.
......	......	...do...	600.00	280.00	...do...	.....do..........	Do.
......	......	...do...	1,600.00	900.00	Fair...	Muscle Shoals Canal.	Do.
......	......	...do...	1,600.00	944.00	...do...	.....do..........	Do.
1907	Rockwood, Tenn	...do...	1,800.00	....	Worthless.	Tennessee River..	Do.
......	......	...do...	2,100.00	1,280.00	Good..	.....do..........	Do.
......	......	...do...	2,100.00	1,280.00	...do...	Hiwassee River..	Do.
......	......	...do...	2,100.00	1.280.00	...do...	Tennessee River..	Do.
......	......	...do...	1,126.00	1,000.00	...do...	.....do..........	Do.
......	......	...do...	1,125.00	1,080.00	...do...	.....do..........	Do.
......	......	...do...	1,287.00	1,000.00	...do...	.....do..........	Do.

[4] Hull built in 1899 (barge No. 2).

[5] Hull built in 1899 (barge No. 4).

[6] Converted hull of old dredge Kentucky; built in 1899.

TABLE VI.—*Statement of floating plant owned by the United States and*

CHATTANOOGA, TENN.—Continued.

Name or number.	Class and description.	Dis-placement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 31	Wood	35.00	50	0	24	0	4	0	1908	Muscle Shoals Canal.
No. 32	do	80.00	120	0	24	0	5	0	1908	do
No. 33	do	80.00	120	0	24	0	5	0	1908	do
No. 34	do	80.00	120	0	24	0	5	0	1908	do
No. 35	do	35.00	50	0	24	0	4	0	1911	do
No. 37	do	17.00	70	0	16	0	3	6	1908	do
No. 38	do	3.00	24	0	10	0	1	6	1908	do
No. 39	Barge	80.00	120	0	24	0	6	0	1909	Muscle Shoals Canal.
No. 40	do	35.00	50	0	24	0	4	0	1910	do
No. 42	do	37.00	60	0	12	0	2	8	1911	Knoxville, Tenn
No. 43	do	37.00	60	0	12	0	2	8	1911	do
No. 1	Dump scow	([1])	73	0	20	0	7	0	1899	Chattanooga, Tenn
No. 2	do	([1])	73	0	20	0	7	0	1899	do
No. 3	do	([1])	73	0	20	0	7	0	1899	do
No. 4	do	([1])	73	0	20	0	6	0	1909	Muscle Shoals Canal.
No. 5	do	([1])	73	0	20	0	6	0	1909	do
No. 6	do	([1])	73	0	20	0	6	0	1909	do
No. 7	do	([1])	73	0	20	0	6	0	1910	do
No. 8	do	([1])	73	0	20	0	6	0	1910	do
No. 9	do	([1])	73	0	20	0	6	0	1911	do
No. 10	do	([1])	73	0	20	0	6	0	1911	do
No. 11	do	([1])	73	0	20	0	6	0	1911	do
No. 12	do	([1])	73	0	20	0	6	0	1911	do
No. 1	Cabin boat	6.00	24	0	10	0			1907	Kingsport, Tenn
No. 2	do	6.00	24	0	12	0			1907	do
No. 3	do	8.00	36	0	12	0			1907	Clinton, Tenn

CHICAGO, ILL.

Name or number.	Class and description.	Dis-placement.	Length.		Beam.		Depth.		When.	Where.
No. 1	Dipper dredge	187.00	79	10	30	0	7	4	1879 1896	Beardstown, Ill Kampsville, Ill. (rebuilt).
No. 2	do	195.00	79	10	30	0	8	0	1882 1896	Beardstown, Ill Kampsville, Ill. (rebuilt).
Fox	Towboat	19.00	69	2	12	0	3	0	1897	Keokuk, Iowa
Pearl	do	45.00	85	1	18	0	4	1	1909	Beardstown, Ill
Dearborn	Steam launch	9.00	50	0	8	6	3	2	1902	Racine, Wis
Calumet	Gasoline launch	2.00	22	0	5	0	1	4	1905	do
M. C	Power skiff		16	0	4	0	1	10	1909	Michigan City, Ind
None	Office boat	48.00	100	0	20	0	4	0	1878 1899	Peoria, Ill Kampsville, Ill. (rebuilt).
No. 1	Quarter boat	12.00	52	0	16	0	3	10	1894	Kampsville, Ill
Margaret	do	130.00	100	0	26	0	4	3	1893	Gasconade, Mo
No. 1	35-ton barge	11.00	50	0	16	0	3	6	1893	Rock Island, Ill
No. 2	do	11.00	50	0	16	0	3	6	1893	do
No. 6	150-ton barge	48.00	100	0	20	0	4	6	1904	Beardstown, Ill
No. 7	do	48.00	100	0	20	0	4	6	1905	do
No. 5	80 cubic-yard dump scow	39.00	70	0	18	0	5	3	1895	Davenport, Iowa

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[1] Eighty cubic yards.

employed in the Engineer Department at Large on June 30, 1911—Continued.

CHATTANOOGA, TENN.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$1,171.00	$752.00	Good.	Tennessee River.	Work of river improvement, Chattanooga district.
		do.	2,756.00	1,760.00	Poor.	do.	Do.
		do.	2,756.00	2,000.00	Fair.	do.	Do.
		do.	2,800.00	1,820.00	do.	do.	Do.
		do.	1,600.00	1,600.00	Good.	do.	Do.
		do.	950.00	616.00	do.	Muscle Shoals Canal.	Do.
		do.	172.00	40.00	Poor.	do.	Do.
		do.	3,276.00	2,100.00	Good.	Tennessee River.	Do.
		do.	1,352.00	1,080.00	do.	do.	Do.
		do.	466.00	466.00	do.	French Broad River.	Do.
		do.	466.00	466.00	do.	do.	Do.
		do.	1,926.00		Worthless.	Muscle Shoals Canal.	Do.
		do.	1,926.00		do.	do.	Do.
		do.	1,926.00		do.	do.	Do.
		do.	3,000.00	1,960.00	Good.	Tennessee River.	Do.
		do.	2,665.00	1,760.00	Fair.	do.	Do.
		do.	2,665.00	1,760.00	Good.	do.	Do.
		do.	2,216.00	1,773.00	Fair.	do.	Do.
		do.	2,949.00	2,360.00	Good.	do.	Do
		do.	2,627.00	2,627.00	do.	do.	Do.
		do.	2,627.00	2,627.00	do.	Muscle Shoals Canal.	Do.
		do.	2,627.00	2,627.00	do.	do.	Do.
		do.	2,627.00	2,627.00	do.	do.	Do.
		do.	45.00		Worthless.	French Broad River.	Do.
		do.	55.00		do.	do.	Do.
		do.	89.00		do.	Tennessee River.	Do.

CHICAGO, ILL.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
		Wood.	$15,000.00	$1,500.00	Very poor.	Improving Illinois River.	Improving Illinois River.
		do.	15,500.00	1,000.00	Unserviceable.	do.	Do.
		do.	4,385.00	2,000.00	Fair.	do.	Do.
		do.	7,000.00	6,500.00	Good.	do.	Do.
1902	Racine, Wis.	Steel.	5,000.00	2,700.00	do.	Chicago and Calumet Rivers and Harbors.	Improving Chicago River, Ill.
1906	Three Lakes, Wis.	Wood.	400.00	150.00	Fair.	Calumet River and Harbor.	Improving Calumet River, Ill. and Ind.
1909	Michigan City, Ind.	do.	100.00	75.00	do.	Michigan City, Ind.	Improving harbor, Michigan City, Ind.
		do.	5,000.00	600.00	Hull, poor; cabin, good.	Improving Illinois River.	Improving Illinois River.
		do.	500.00	50.00	Unserviceable.	do.	Do.
		do.	Not known.	4,000.00	Good.	do.	Do.
		do.	400.00	100.00	Poor.	do.	Illinois and Mississippi Canal.
		do.	400.00	100.00	do.	do.	Do.
		do.	1,200.00	800.00	Good.	do.	Improving Illinois River.
		do.	1,200.00	900.00	do.	do.	Do.
		do.	1,475.00		Unserviceable.	do.	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

CHICAGO, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
No. 6	80 cubic-yard dump scow	39.00	70 0	18 0	5 3	1896 1908	Davenport, Iowa Beardstown, Ill. (rebuilt).
No. 8	do	39.00	70 0	18 0	5 3	1897	Kampsville, Ill
No. 9	do	39.00	70 0	18 0	5 3	1900	do
No. 10	do	39.00	70 0	18 0	5 3	1900	do
No. 11	do	39.00	70 0	18 0	5 3	1907	Beardstown, Ill
No. 12	do	39.00	70 0	18 0	5 3	1907	do
No. 13	do	39.00	70 0	18 0	5 3	1908	do
No. 1	Pontoon	5.00	28 0	8 0	2 6	1907	Chicago, Ill

CINCINNATI, OHIO, FIRST DISTRICT.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Indiana[1]	(B) Hydraulic pipe line and grapple dredge.	417.50	125 0	34 0	6 10	1908	Jeffersonville, Ind
Ohio	(C) Dipper dredge	270.00	110 0	31 6	6 8	[2]1880	St. Louis, Mo
Oswego	do	235.00	92 0	31 6	6 1	1883	do
Woodruff, E. A	(D) Snag boat	863.00	220 0	48 0	7 6	1874 1876	Newport, Ky Pittsburgh, Pa
E. A. W	(H) Steam launch	16.00	30 0	9 6	2 6	1901	New Albany, Ind
Nell	(H) Gasoline launch	1.50	25 0	5 6	2 3	1893	Gloucester City, N. J.
Mignon	do	.50	18 4	5 2	2 1	1910	Salem, Ohio
No name	(I) Maneuver boat	71.00	75 0	22 0	3 3	1910	Elizabeth, Pa
No. 1	Dump scow (106 cubic yards).	[3]70.00 [4]195.00	75 0	20 0	5 8	[5]1904	do
No. 2	do	[3]70.00 [4]195.00	75 0	20 0	5 8	[5]1904	do
No. 3	do	[3]70.00 [4]195.00	75 0	20 0	5 8	[5]1904	do
No. 4	do	[3]70.00 [4]195.00	75 0	20 0	5 8	1895	Jeffersonville, Ind.; rebuilt 1908.
No. 1	Decked flatboat	[3]75.00 [4]211.00	100 0	20 0	5 3	1897	Cincinnati, Ohio
No. 2	Decked flatboat (136 tons).	[3]75.00 [4]211.00	100 0	20 0	5 0	1909	Levanna, Ohio
No. 3	Flatboat (3 tons)	3.50	26 0	4 6	1 6	1897	Cincinnati, Ohio
No. 4	do	3.50	26 0	4 6	1 6	1897	do
No. 5	Flatboat (6 tons)	8.00	35 0	9 0	1 7	1901	Paducah, Ky
No. 6	Flatboat (206 tons)	[3]63.00 [4]266.00	110 0	24 0	5 0	1908	Ambridge, Pa
Nos. 1 to 10	Pontoons	17.00	40 0	12 0	3 2	1908	Springfield, Ill

CINCINNATI, OHIO, SECOND DISTRICT.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Carrollton[6]	Dipper dredge	250.00	80 0	30 0	6 9	1901	Jeffersonville, Ind
Frankfort[7]	do	115.00	72 0	19 0	5 5	1908	Hull built by United States at Frankfort, Ky.; machinery, at Marion, Ohio.
Malta[6]	Endless chain or ladder dredge.	160.00	70 0	31 4	6 10	1887 1888	Bucyrus, Ohio
Kentucky	Combined tow and snag boat.	370.00	127 0	30 0	5 6	1909	Jeffersonville, Ind
Gregory	Stern-wheel towboat	240.00	115 0	22 0	4 2	1910	do
Merrill	do	163.00	115 0	22 0	3 0	1907 1908	do
Vega	do	112.00	104 0	17 4	4 0	1901	do
Pearl	Gasoline launch	5.00	40 0	7 6	4 0	1899	Grand Rapids, Mich.
Pioneer	do	20.00	35 0	8 6	4 0	1908	Bay City, Mich

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[1] Discharge pipe, 17 inches outside diameter.
[2] Remodeled 1905-6.
[3] Light.
[4] Loaded.

employed in the Engineer Department at Large on June 30, 1911—Continued.

CHICAGO, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$1,475.00	$1,000.00	Good..	Improving Illinois River.	Improving Illinois River.
......	....	...do...	1,150.00	....	Unserviceable.	.....do............	Illinois & Mississippi Canal.
......	....	...do...	1,500.00	....	...do...	.....do............	Improving Illinois River.
......	....	...do...	1,500.00	....	...do...	.....do............	Do.
......	....	...do...	1,350.00	1,100.00	Good .	.....do............	Do.
......	....	...do...	1,350.00	1,100.00	...do...	.....do............	Do.
......	....	...do...	1,350.00	1,150.00	...do...	.....do............	Do.
1908	Chicago, Ill......	...do...	200.00	250.00	...do...	Chicago River....	Improving Chicago River, Ill.

CINCINNATI, OHIO, FIRST DISTRICT.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Steel..	$100,586.13	$100,586.13	Good .	Ohio River.......	Improving Ohio River.
......	....	Iron...	32,000.00	35,000.00	...do...	.....do............	Do.
......	....	...do...	30,500.00	32,000.00	...do...	.....do............	Do.
......	....	Iron, steel, and wood.	126,137.00	60,000.00	...do...	.....do............	Do.
......	....	Steel..	2,358.33	1,800.00	...do ..	.....do............	Do.
1893	Gloucester City, N. J.	Wood.	1,102.50	800.00	...do...	.....do............	Do.
1910	Cincinnati, Ohio.	Steel..	398.43	390.00	...do...	.....do............	Do.
......	....	Wood.	2,323.27	2,323.27	...do...	Dam No. 37......	Do.
......	....	...do...	3,889.32	2,500.00	Poor..	Ohio River.......	Do.
......	....	...do...	3,889.32	2,500.00	...do...	.....do............	Do.
......	....	...do...	3,889.32	2,500.00	...do...	.....do............	Do.
......	....	...do...	2,750.00	4,000.00	Good .	.....do............	Do.
......	....	...do...	1,194.00	200.00	Poor..	.....do............	Do.
......	....	...do...	1,750.00	1,750.00	Good .	.....do............	Do.
......	....	Steel..	94.00	37.50	Fair...	.....do............	Do.
......	....	...do...	94.00	37.50	...do...	.....do............	Do.
......	....	Wood.	100.00	20.00	Poor..	.....do............	Do.
......	....	Steel..	7,425.00	7,425.00	Good .	.....do............	Do.
......	....	...do...	13,800.00	13,800.00	...do...	.....do............	Do.

CINCINNATI, OHIO, SECOND DISTRICT.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Wood.	$22,272.00	$12,000.00	Fair...	Kentucky River .	Improving Kentucky River.
......	....	...do...	10,193.26	10,000.00	Good .	.....do............	Do.
......	....	...do...	13,000.00	11,500.00	...do...	Muskingum River.	Improving Muskingum River.
......	....	...do...	27,078.50	23,000.00	...do...	Kentucky River .	Improving Kentucky River.
......	....	...do...	16,915.00	15,000.00	...do...	.....do............	Do.
......	....	...do...	14,400.00	11,000.00	...do...	Muskingum River.	Improving Muskingum River.
......	....	...do...	9,805.00	6,300.00	Fair...	.....do............	Do.
1899	Grand Rapids, Mich.	...do...	1,705.00	800.00	...do...	Kentucky River .	Improving Kentucky River.
1908	Bay City, Mich..	...do...	1,975.00	1,500.00	Good .	Big Sandy River.	Improving Big Sandy River.

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[5] Rebuilt.
[6] Formerly No. 1.
[7] Formerly No. 2.
[8] Reconstructed in 1909.

TABLE VI.—*Statement of floating plant owned by the United States and*

CINCINNATI, OHIO, SECOND DISTRICT—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 1[1]	Maneuvering boat	79.00	50	0	20	0	3	4	1904	Louisa, Ky.
No. 2[2]	do	79.00	50	0	20	0	3	4	1904	do
No. 3[3]	do	123.00	60	0	26	0	3	4	1908	do
No. 4[4]	Derrick and pile driver	65.00	65	0	30	0	4	4	1896	Cincinnati, Ohio
No. 5[5]	do	55.00	60	0	26	0	3	0	1895	do
No. 6[6]	Floating steam pile driver with derrick.	50.00	50	0	28	0	3	10	1899	do
No. 7[7]	Needle boat	10.00	54	0	10	0	1	10	1909	do
No. 8[8]	do	10.00	54	0	10	0	1	10	1910	Cincinnati, Ohio
No. 9[9]	Work and store boat	16.00	50	0	12	0	3	2	1910	do
No. 10[8]	Quarter boat	22.00	75	0	14	0	1	9	1904	do
No. 11[4]	do	40.00	90	0	18	0	3	6	1900	do
No. 12[5]	do	25.00	78	0	11	0	4	0	1898	do
No. 13[4]	80-cubic-yard side-dump scow.	30.00	75	0	17	0	6	4½	1907	Pittsburgh, Pa.
No. 14[5]	do	30.00	75	0	17	0	6	4½	1907	do
No. 15[10]	do	30.00	75	0	17	0	6	4	1899	Elizabeth, Pa.
No. 16[11]	92-cubic-yard center-dump scow.	200.00	56	6	26	9	6	1	1904	Cincinnati, Ohio
No. 17[10]	do	200.00	56	6	26	9	6	1	1904	do
No. 18[11]	72-ton decked barge	94.00	75	0	15	6	4	0	1909	do
No. 19[10]	63-ton decked barge	82.00	75	0	15	6	3	7	1909	do
No. 20[12]	do	82.00	75	0	15	6	3	7	1897	do
No. 21[13]	19-ton decked barge	25.00	40	0	12	0	2	8	1911	do
No. 22[13]	190-ton decked barge	45.00	98	0	18	0	5	0	1895	do
No. 23[13]	do	45.00	98	0	18	0	5	0	1895	do
No. 24[14]	170-ton decked barge	40.00	80	0	20	0	5	0	1895	do
No. 25[15]	190-ton decked barge	40.00	88	0	19	0	5	0	1896	do
No. 26[16]	300-ton decked barge	50.00	99	0	20	0	6	0	1908	Point Pleasant, Ohio
No. 27[17]	do	50.00	99	0	20	0	6	0	1908	do
No. 28[18]	35-ton open barge	8.00	55	0	10	0	3	6	1896	Cincinnati, Ohio
No. 29[19]	300-ton decked barge	50.00	99	0	20	0	5	4	1910	Point Pleasant, Ohio
No. 30[20]	52-ton decked barge	78.00	65	0	14	5	3	5		
No. 31[21]	22-ton barge	34.00	50	4	11	10	2	6		
No. 32[22]	do	31.00	39	8	11	5	2	10		
No. 33[23]	10-ton push boat	14.00	36	0	10	0	1	8		
No. 34[24]	do	14.00	36	0	10	0	1	8		
No. 35[25]	12-ton push boat	17.00	40	0	10	0	1	10		

CLEVELAND, OHIO.

Burton	Seagoing suction dredge.	1,200.00	177	0	38	0	19	0	1905	Sparrows Point, Md.
Maumee	Dipper dredge	549.00	100	0	36	0	10	0	1893	Cleveland, Ohio
Visitor	Steam tug	90.11	80	8	20	0	6	4	1892	Detroit, Mich
Spear	do	160.00	85	0	20	0	10	0	1893	Green Bay, Wis.
Quest	do	46.00	65	0	15	0	8	0	1903	Ashtabula, Ohio
Inspector	Gasoline launch	6.00	34	0	7	0	4	6	1901	Detroit, Mich
Ariel	do	6.00	36	0	7	6	5	0	1905	Ashtabula, Ohio
Burton No. 1	do	.90	16	0	4	6	3	0	1905	Cleveland, Ohio
No. 1	Dump scow, 3 pockets	(26)	92	0	24	0	7	6	1893	do
No. 2	do	(26)	92	0	24	0	7	6	1893	do
No. 3	do	(26)	92	0	24	0	7	6	1893	do
No. 4[27]	Dump scow, 7 pockets	(26)	125	0	34	0	10	6	1907	Port Clinton, Ohio

[1] Formerly Catlettsburg No. 1.
[2] Formerly Kavanaugh No. 1.
[3] Formerly Louisa No. 2.
[4] Formerly No. 1.
[5] Formerly No. 2.
[6] Formerly pile driver; reconstructed in 1909-10.
[7] Formerly Kentucky No. 1.
[8] Formerly Kentucky No. 2.
[9] Formerly Muskingum No. 1.
[10] Formerly No. 4.
[11] Formerly No. 3.
[12] Formerly No. 5.
[13] Formerly No. 6.
[14] Formerly No. 7.

employed in the Engineer Department at Large on June 30, 1911—Continued.

CINCINNATI, OHIO, SECOND DISTRICT—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$1,592.04	$1,400.00	Fair ..	Big Sandy River.	Improving Big Sandy River.
		.. do...	1,592.04	1,400.00	...do ..	.....do...........	Do.
		...do...	3,238.00	2,800.00	Good .	.....do...........	Do.
		...do...	Unknown.	2,000.00	Fair...	Kentucky River .	Improving Kentucky River.
		...do...	Unknown.	1,000.00	Poor..	.....do...........	Do.
		...do...	1,665.00	1,500.00	Good .	Muskingum River.	Improving Muskingum River.
		...do...	235.63	230.00	...do...	Kentucky River .	Improving Kentucky River.
		...do..	348.69	348.69	...do ..	.....do...........	Do.
		...do ..	806.24	750.00	...do ..	Muskingum River.	Improving Muskingum River.
		...do ..	1,600.00	1,100.00	...do ..	.....do...........	Do.
		...do ..	1,200.00	1,000.00	...do ..	Kentucky River .	Improving Kentucky River.
		...do ..	Unknown.	400.00	Poor ..	.....do...........	Do.
		...do ..	3,108.00	1,500.00	...do ..	.....do...........	Do.
		...do ..	3,108.00	1,500.00	...do ..	.....do...........	Do.
		...do ..	1,700.00	25.00	Worthless.	.....do...........	Do.
		...do..	2,650.00	1,260.00	Good..	Muskingum River.	Improving Muskingum River.
		...do ..	2,650.00	1,260.00	...do..	.....do...........	Do.
		...do ..	700.00	600.00	...do ..	.....do...........	Do.
		...do ..	600.00	300.00	Fair...	.....do...........	Do.
		...do ..	397.00	180.00	...do ..	.....do...........	Do.
		...do..	447.27	447.00	Good..	.....do...........	Do.
		...do..	Unknown.	800.00	Fair...	Kentucky River .	Improving Kentucky River.
		...do ..	Unknown.	800.00	...do ..	.....do...........	Do.
		...do..	Unknown.	250.00	Poor ..	.....do...........	Do.
		...do..	Unknown.	800.00	Fair...	.....do...........	Do.
		...do..	2,150.00	1,700.00	Good..	.....do...........	Do.
		...do..	2,150.00	1,700.00	...do..	.....do...........	Do.
		...do..	Unknown.	300.00	...do..	.....do...........	Do.
		...do..	2,200.00	2,000.00	...do..	.....do...........	Do.
1910	Catlettsburg, Ky.	...do..	150.00	125.00	Fair...	Big Sandy River.	Improving Big Sandy River.
1910	.....do...........	...do..	100.00	75.00	Poor ..	.....do...........	Do
1910	.....do...........	...do..	80.00	65.00	Fair...	.....do...........	Do.
1910	Louisa, Ky.....	...do..	124.50	115.00	Good .	.....do...........	Do.
1909	.....do...........	...do..	100.00	75.00	...do ..	.....do...........	Do.
1907	Catlettsburg, Ky.	...do..	65.00	35.00	Fair...	.....do...........	Do.

CLEVELAND, OHIO.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1904	Sparrows Point, Md.	Steel..	$184,300.00	$150,000.00	First class.	On general work of the district as needed.	Cleveland district works.
1893	Cleveland, Ohio.	Wood.	28,000.00	50,000.00	...do..	.....do...........	Do.
1907	Sandusky, Ohio.	Steel..	14,000.00	10,000.00	Good .	.....do...........	Do.
1893	Port Huron, Mich.	Wood.	8,000.00	5,000.00	...do..	.....do...........	Do.
1903	Ashtabula, Ohio	...do..	7,000.00	4,000.00	...do ..	.....do...........	Do.
1901	Detroit, Mich...	...do..	1,375.00	500.00	...do ..	.....do...........	Do.
1905	Cleveland, Ohio.	...do..	500.00	500.00	...do ..	.....do...........	Do.
1905	.....do...........	...do..	250.00	100.00	...do ..	.....do...........	Do.
1893	.....do...........	...do..	3,000.00	1,000.00	...do ..	.....do...........	Do.
1893	.....do...........	...do..	3,000.00	1,000.00	...do ..	.....do...........	Do.
1893	.....do...........	...do..	3,000.00	1,000.00	...do..	.....do...........	Do.
1907	Port Clinton, Ohio.	...do..	14,428.00	12,000.00	...do...	.....do...........	Do.

[15] Formerly No. 8.
[16] Formerly No. 10.
[17] Formerly No. 11.
[18] Formerly No. 12.
[19] Formerly No. 13.
[20] Formerly D1.
[21] Formerly TL1.
[22] Formerly S1.
[23] Formerly Louisa No. 1.
[24] Formerly Kavanaugh No. 2.
[25] Formerly Louisa No. 3.
[26] Not known.
[27] 500 cubic yards capacity.

TABLE VI.—*Statement of floating plant owned by the United States and*

CLEVELAND, OHIO—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 5[1]	Dump scow, 7 pockets	(2)	125	0	34	0	10	6	1907	Port Clinton, Ohio
No. 1	Lighter	(2)	80	0	19	6	6	6	1893	Cleveland, Ohio
Do	Deck scow	(2)	30	0	18	0	4	0	1902	do
No. 2	do	(2)	23	1	11	6	2	6	1906	Ashtabula, Ohio
No. 1	Barge	(2)	120	0	24	0	5	0	1903	Sandusky, Ohio

DALLAS, TEXAS.

Name or number.	Class and description.	Displacement.	Length.		Beam.		Depth.		When.	Where.
Sabine	Seagoing suction dredge	750.00	137	0	35	0	12	0	1901	New York, N. Y
Port Arthur	Hydraulic pipe line dredge	156.00	60	0	28	0	6	0	1901	Port Arthur, Tex
C. A. Culberson	Snag boat	200.00	106	0	28	0	5	0	1908	Jeffersonville, Ind.
Trinity	do	190.00	106	0	30	0	5	0	1904	Texas City, Tex
Waco	do	200.00	118	8	30	2	5	0	1910	Jeffersonville, Ind
Navasota	do	140.00	90	4	24	7	5	0	1904	Orange, Tex
Brazos	Steam launch	15.00	50	0	14	0	2	2	1903	Old Washington, Tex.
Caddo	Gasoline launch	2.50	30	0	8	0	3	0	1911	On Red River, La., and Ark.
Eureka	do	1.80	30	2	7	8	3	2	1910	On Brazos River, Tex.
Geo. A. Trumbull	do	2.00	21	0	5	0	2	0	1906	Racine, Wis
Ino	do	1.00	22	0	6	8	2	6	1908	Lake Charles, La
Juanita	do	1.00	22	0	6	0	2	2	1910	On Red River, La. and Ark.
Morris Sheppard	do	5.00	35	0	7	6	3	0	1907	Racine, Wis
Sextant	do	2.00	27	0	6	0	4	0	1906	Clinton, Ohio
Transit	do	2.50	27	0	6	0	2	5	1892	New York, N. Y
Maneuver boat No. 1	Maneuver boat (scow)	15.00	45	10	16	0	3	4	1910	Lock and Dam No. 1, Trinity River.
No. 1, Neches River	Quarter boat	27.00	60	0	16	0	4	0	1906	Beaumont, Tex
No. 1, Cypress Bayou	do	20.00	60	0	16	0	3	0	1905	Arthur City, Tex
No. 1, Red River	do	24.00	60	0	22	0	3	0	1907	Denison, Tex
No. 2, Red River	do	24.00	60	0	22	0	3	3	1907	do
No. 1, Sulphur River	do	24.00	60	0	22	0	3	0	1907	Draper, Tex
No. 1, Trinity River	do	24.00	60	0	22	0	3	0	1909	Lock and Dam No. 1, Trinity River.
No. 2, Trinity River	do	24.00	60	0	22	0	3	0	1909	do
No. 3, Trinity River	do	20.00	54	0	18	0	3	0	1907	Riverside, Tex
Barge No. 1	32-ton barge	24.00	38	0	14	0	5	0	1902	Port Arthur, Tex
Barge No. 2	30-ton barge	19.00	32	0	14	0	5	0	1909	do
e No. 3	do	19.00	32	0	14	0	5	0	1909	do

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[1] 500 cubic yards capacity.

employed in the Engineer Department at Large on June 30, 1911—Continued.

CLEVELAND, OHIO—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1907	Port Clinton, Ohio.	Wood.	$14,477.00	$12,000.00	Good..	On general work of the district as needed.	Cleveland district works.
1893	Cleveland, Ohio.	...do..	2,000.00	1,500.00	...do..	.....do..........	Do.
1902	.....do..........	...do..	700.00	500.00	...do..	.....do..........	Do.
1906	Ashtabula, Ohio.	...do..	100.00	100.00	...do..	.....do..........	Do.
1903	Sandusky, Ohio.	...do..	4,100.00	2,000.00	Fair..	.....do..........	Do.

DALLAS, TEXAS.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1901	New York, N. Y.	Wood.	$84,833.40	$60,000.00	Fair...	Sabine Pass Jetty Channel.	Improving Sabine Pass, Tex. and La.
1907	Port Arthur, Tex.	...do..	12,000.00	5,000.00	Bad...	Port Arthur Ship Canal.	Operating and care Port Arthur Canal.
1908	Jeffersonville, Ind.	...do..	21,840.00	18,000.00	Good.	Red River, La. and Ark. above Fulton, Ark.	Improving Red River, La. and Ark. above Fulton, Ark.
1904	Texas City, Tex.	...do..	19,500.00	18,000.00	...do..	Trinity River, Tex.	Improving Trinity River, Tex.
1910	Jeffersonville, Ind.	...do..	29,935.00	28,000.00	Excellent.	Brazos River, Tex.	Improving Brazos River, Tex.
1907	Galveston, Tex..	...do..	2,400.00	8,000.00	Good..	.....do..........	Do.
......	....	...do..	....	3,500.00	Excellent.	.....do..........	Do.
1911	On Red River, La. and Ark.	...do..	1,000.00	1,000.00	...do..	Cypress Bayou, La. and Tex.	Improving Cypress Bayou, La. and Tex.
1910	On Brazos River, Tex.	...do..	744.56	600.00	Good..	Brazos River, Tex.	Improving Brazos River, Tex.
1906	Racine, Wis.....	...do..	500.00	50.00	Poor..	Trinity River, Tex.	Improving Trinity River, Tex.
1909	Liberty, Tex....	...do..	125.00	50.00	Fair...	.....do..........	Do.
1910	On Red River, La. and Ark.	...do..	315.05	300.00	Good..	Red River, La. and Ark. above Fulton, Ark.	Improving Red River, La. and Ark. above Fulton, Ark.
1907	Racine, Wis	...do..	2,050.00	1,500.00	...do..	.....do	Do.
1906	Clinton, Ohio...	...do..	1,528.00	1,000.00	...do..	Port Arthur Ship Canal, Tex.	Operating and care Port Arthur Canal.
1892	New York, N. Y.	...do..	....	250.00	Poor..	Sabine and Neches Rivers, Tex.	Improving Sabine and Neches Rivers, Tex.
1910	Lock and Dam No. 1, Trinity River.	...do..	750.00	500.00	Good..	Lock and Dam No. 1, Trinity River, Tex.	Operating and care locks and dams section 1, Trinity River, Tex.
1911	Beaumont, Tex.	...do..	750.00	750.00	...do..	Neches River, Tex.	Improving Sabine-Neches Canal.
1905	Arthur City, Tex.	...do..	800.00	250.00	Poor..	Cypress Bayou, Tex. and La.	Improving Cypress Bayou, Tex. and La.
1907	Denison, Tex...	...do..	1,200.00	250.00	...do..	Red River, La. and Ark. above Fulton, Ark.	Improving Red River, La. and Ark. above Fulton, Ark.
1907	.....do..........	...do..	1,200.00	800.00	Fair...	.....do..........	Do.
1907	Draper, Tex....	...do..	1,300.00	1,000.00	Good..	Sulphur River, Tex. and Ark.	Improving Sulphur River, Tex. and Ark.
1909	Lock and Dam No. 1, Trinity River.	...do..	1,250.00	1,000.00	...do..	Trinity River, Tex.	Improving Trinity River, Tex.
1909	.....do..........	...do..	1,250.00	800.00	Good..	.....do..........	Do.
1907	Riverside, Tex..	...do..	900.00	250.00	Poor..	.....do..........	Do.
1907	Port Arthur, Tex.	...do..	....	300.00	...do..	Port Arthur Canal.	Operating and care Port Arthur Canal.
1909	.....do..........	...do..	750.00	600.00	Good	.....do..........	Do.
1909	.....do..........	...do..	750.00	600.00	...do..	.....do..........	Do.

[3] Not known.

TABLE VI.—*Statement of floating plant owned by the United States and*

DETROIT, MICH. (Lake Survey).

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Surveyor	(E) Survey steamer	176.00	86 9	20 1	8 5	1891	South Haven, Mich.
Col. J. L. Lusk	do	295.00	114 6	19 4	11 10	1884	Manistee, Mich.
Search	do	200.00	133 0	17 6	10 0	1896	Buffalo, N. Y.
U. S. Lake Survey, No. 1.	do	56.00	65 0	13 6	6 6	1891	Oshkosh, Wis.
U. S. Lake Survey, No. 2.	do	48.00	60 6	14 6	7 6	[1] 1909	Detroit, Mich.
U. S. Lake Survey, No. 3.	(H) Motor launch	2.60	22 0	6 0	3 0	1902	St. Joseph, Mich.
U. S. Lake Survey, No. 4.	do	10.00	32 11	9 10	4 6	1905	Detroit, Mich.
U. S. Lake Survey, No. 5.	do	18.00	32 6	9 0	4 0	1909	Manitowoc, Wis.
U. S. Lake Survey, No. 6.	do	10.00	32 6	9 0	4 0	1909	do
U. S. Lake Survey, No. 7.	do	22.00	22 4	6 6	3 0	[4] 1905	Unknown
No. 1	Catamaran		27 0	21 0	2 0	1898	Detroit, Mich.
No. 2	do		27 0	21 0	2 0	1899	do
No. 3	do		27 0	21 0	2 0	1899	do
No. 1	Sweeping float (2 sections).		30 0	80 0	3 4	1902	Port Huron, Mich.

DETROIT, MICH.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Alfred Noble	Survey steamer	83.00	67 6	15 6	7 1	1905	Toledo, Ohio
Hancock	do	151.00	96 6	17 0	7 6	1890 1906	Saugatuck, Mich. Rebuilt at Detroit, Mich.
West Neebish	Tug	47.00	53 3	15 1	8 2	1909	Sault Ste. Marie, Mich.
Sapper	do	160.00	68 0	16 10	9 7	1888	Buffalo, N. Y.; rebuilt at Toledo, Ohio.
Don	Gasoline launch	9.00	41 9	9 7	3 6	1904	Detroit, Mich.
No. 1	do		25 0	5 6	4 0	1894	New York, N. Y.
Hancock No. 1	do	.50	15 6	4 6	2 6	1910	Detroit, Mich.
Hay Lake	Quarter boat	106.00	70 0	22 0	4 4	1895	Sault Ste. Marie, Mich.

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[1] Rebuilt by U. S. Lake Survey; completed in 1910.
[2] Built by U. S. Lake Survey.
[3] Built for U. S. Lake Survey.
[4] Small boat of steamer Search converted into motor launch in 1905; rebuilt by Lake Survey in 1911.

employed in the Engineer Department at Large on June 30, 1911—Continued.

DETROIT, MICH. (Lake Survey).

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1903	Mackinac, Mich.	Wood.	Unknown.	$18,000.00	Good..	Surveys..........	Survey northern and northwestern lakes.
1891	Manistee, Mich..	...do..	Unknown.	26,000.00	...do..	.....do...........	Do.
1899	New York, N. Y.	Steel..	Unknown.	25,000.00	...do..	.....do...........	Do.
1899	Milwaukee, Wis.	Wood.	$6,020.44	3,000.00	Fair...	.....do...........	Do.
......	....	...do..	Unknown.	5,000.00	Good..	.....do...........	Do.
1902	St. Joseph, Mich.	...do..	$940.00	300.00	Fair...	.....do...........	Do.
......	(2)	...do..	1,000.00	1,000.00	Good..	.....do...........	Do.
......	(3)	...do..	1,425.00	1,425.00	...do..	.....do...........	Do.
......	(3)	...do..	1,425.00	1,425.00	...do..	.....do...........	Do.
......	Unknown........	...do..	Unknown.	350.00	...do..	.....do...........	Do.
1898	Detroit, Mich...	(5)....	1,248.33	500.00	Fair...	.....do...........	Do.
1899	.....do..........	(5)....	1,248.33	500.00	...do..	.....do...........	Do.
1899	.....do..........	(5)....	1,248.33	500.00	...do..	.....do...........	Do.
1902	Port Huron, Mich.	(5)....	[6] 8,000.00	[7] 1,500.00	Good..	.....do...........	Do.

DETROIT, MICH.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1905	Toledo, Ohio....	Steel..	$19,800.00	$15,000.00	Fair...	St. Marys River..	Improving Middle and West Neebish Channels, St. Marys River.
......	....	Wood.	10,000.00	7,500.00	...do..	St. Marys, St. Clair, and Detroit Rivers, and Lakes Huron and St. Clair.	Ship channel connecting waters of the Great Lakes between Chicago, Duluth, and Buffalo.
1909	Sault Ste. Marie, Mich.	...do..	7,668.50	7,000.00	Good..	St. Marys River, Mich.	Improving St. Marys River, Hay Lake, and Neebish Channels.
1903	Detroit, Mich...	...do..	9,500.00	6,000.00	Fair...	Harbor Beach, Mich.	Improving harbor, Cheboygan, Alpena, Harbor Beach, and Saginaw and Black Rivers.
1907	.....do...........	...do..	2,170.00	1,500.00	...do..	Detroit River....	Improving Detroit River, Mich.
1896	Chattanooga, Tenn.	...do..	600.00	300.00	...do..	St. Clair Flats Canal.	Harbor of Refuge, Harbor Beach, Mich.
1910	Detroit, Mich...	...do..	199.00	199.00	Good..	With U. S. S. Hancock.	Same as U. S. S. Hancock.
......	....	...do..	3,300.00	1,750.00	Fair...	St. Marys River, Mich.	Improving Hay Lake and Neebish Channels, St. Marys River, Mich.

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[5] Steel and wood.
[6] For 7 sections.
[7] For 2 sections.

TABLE VI.—*Statement of floating plant owned by the United States and*

DULUTH, MINN.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Vidette	Steam yacht	124.00	87	7	14	9	7	7	1886	Poughkeepsie, N. Y.
Essayons	Steam tug	130.00	74	6	21	0	11	6	1908	Muskegon, Mich.
Circle	do.	43.00	49	5	13	0	6	7	1885	Buffalo, N. Y.
Tangent	Steam launch	13.00	41	0	8	6	3	7	1889	Chicago, Ill.
Curve	Naphtha launch	2.00	20	4	5	5	2	7	1897	St. Joseph, Mich.
Chord	do.	2.00	20	4	5	5	2	7	1897	do.
Arc	do.	1.00	15	0	4	5	2	0	1897	do.
Tortoise	Hydraulic pipe line dredge.	196.00	102	0	24	0	5	6	1905	Superior Entry, Wis.
No. 4	Pile-driver scow	56.00	57	0	24	0	3	6	1904	do.
No. 6	400-ton derrick scow	185.00	102	6	32	0	7	10	1906	do.
No. 7	do.	185.00	102	6	32	0	7	10	1907	do.
No. 8	70-ton derrick scow	40.00	70	0	20	0	5	6	1907	do.
No. 1	200-ton flat scow	48.00	90	0	20	0	6	6	(3)	
No. 10	90-ton flat scow	36.00	60	0	26	0	3	10	1908 1909	Superior Entry, Wis.
No. 2	50-ton flat scow	23.00	51	0	17	3	3	6	(4)	Unknown.
No. 9	8-ton flat scow	4.00	20	0	15	0	3	0	1899	Houghton, Mich.
No. 3	5-ton flat scow	4.00	18	4	11	6	2	3	(4)	Unknown.

GALVESTON, TEX.

Name or number.	Class and description.	Displacement.	Length ft.	Length in.	Beam ft.	Beam in.	Depth ft.	Depth in.	When.	Where.
Galveston	Sea-going hopper dredge.	3,500.00	304	0	51	0	27	0	1908	Sparrows Point, Md.
Gen. C. B. Comstock	do.	764.13	177	0	35	6	16	0	1905	Perth Amboy, N. J.
Col. A. M. Miller	Pipe line hydraulic dredge.	942.60	138	6	37	0	13	0	1906	Galveston, Tex.
Capt. C. W. Howell	Suction dredge and snag boat.	200.00	125	0	25	0	5	0	1904	Texas City, Tex.
Guadalupe	Dredge and snag boat	227.00	118	0	28	0	5	9	1908	Victoria, Tex.
Captain Talfor	Tugboat	43.00	77	0	16	2	8	0		
Helen	Steam launch	33.00	56	0	12	4	6	0	1901	Galveston, Tex.
Bastrop	Gasoline launch	16.00	46	6	11	3	5	0	1908	Cedar Bayou, Tex.
Hill	do.	6.90	30	9	7	7	2	6	1905	Galveston, Tex.
Bar	do.	2.00	27	0	7	0	3	0	1907	do.
Victoria	do.	3.00	27	0	6	0	3	0	1908	do.

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[1] Equipped.
[2] Equipped, $2,500.
[3] Rebuilt Duluth, 1900; partly rebuilt, 1908-9.
[4] Unknown.

employed in the Engineer Department at Large on June 30, 1911—Continued.

DULUTH, MINN.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1897	Duluth, Minn.	Wood.	$7,000.00	$5,000.00	Good.	Duluth, Minn., district.	Duluth - Superior Harbor.
1909	Built under contract, Racine Boat Manufacturing Co.	Steel.	35,950.00	40,000.00	do.	Duluth - Superior Harbor.	Superior Entry, Wis.
1903	Duluth, Minn.	Wood.	2,500.00	3,000.00	do.	Houghton, Mich.	Portage Canals, Mich.
1889	Chicago, Ill.	do.	1,900.00	500.00	Fair.	Duluth-Superior Harbor.	Duluth - Superior Harbor.
1897	St. Joseph, Mich.	do.	800.00	300.00	do.	do.	Do.
1897	do.	do.	800.00	250.00	do.	do.	Superior Entry, Wis.
1897	do.	do.	375.00	125.00	do.	Houghton, Mich.	Duluth - Superior Harbor.
		do.	[1] 27,170.00	25,000.00	Good.	Duluth-Superior Harbor.	Superior Entry, Wis.
		do.	3,520.00	(2)	do.	do.	Do.
		do.	11,860.00	10,000.00	do.	do.	Do.
		do.	12,662.00	11,000.00	do.	do.	Do.
		do.	3,000.00	3,000.00	do.	Houghton, Mich.	Portage Canals, Mich.
1903	Duluth, Minn.	do.	1,500.00	1,900.00	do.	Duluth, Minn., and Superior, Wis.	Superior Entry, Wis.
		do.	2,498.00	1,900.00	A No. 1.	Duluth-Superior Harbor.	Do.
	(5)	do.		35.00	Poor.	do.	Do.
		do.	60.00	20.00	do.	Houghton, Mich.	Portage Canals, Mich.
1904	Duluth, Minn.	do.	35.00	15.00	do.	Duluth-Superior Harbor.	Superior Entry Wis.

GALVESTON, TEX.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
		Steel.	$357,500.00	$305,663.00	Good.	Galveston Harbor, Tex.	Improving harbor, Galveston, Tex.
		Wood.	86,000.00	72,900.00	do.	Wilmington, N.C.	Do.
		do.	102,000.00	73,440.00	do.	Galveston Channel.	Improving Galveston Channel.
		do.	18,000.00	32,400.00	do.	Aransas Pass to Pass Cavallo.	Improving West Galveston Bay Channel and adjacent streams.
		do.	36,977.35	29,160.00	do.	Galveston ship channel.	Inland waterway on coast of Texas (Guadalupe River).
1905	Mobile, Ala.	do.	12,000.00	11,520.00	do.	Galveston, Tex.	Galveston Harbor and ship channel and Buffalo Bayou.
		do.	4,000.00	2,520.00	do.	Galveston Bay.	Improving ship channel and Buffalo Bayou.
		do.	4,300.00	3,600.00	do.	Galveston, Tex.	Improving inland water on coast of Texas.
		do.	2,000.00	1,800.00	do.	do.	River and harbor improvement.
		do.	1,300.00	1,035.00	do.	Galveston, Tex., and vicinity.	Improving inland waterway on coast of Texas.
		do.	1,100.15	720.00	do.	Guadalupe River, Tex.	Improving inland waterway on coast of Texas (Guadalupe River).

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[5] Picked up on beach after being abandoned by owner.

Original cost of dredge Tortoise equipped, $10,698.65; new machinery and rebuilding in 1910, $14,155.32; additional boiler and discharge pipe in 1911, $2,316.03; total cost, $27,170. Flat scow No. 5 now a part of dredge Tortoise.

TABLE VI.—*Statement of floating plant owned by the United States and*

GALVESTON, TEX.—Continued.

Name or number.	Class and description.	Dis-placement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Launch G	Gasoline launch	1.50	25	0	8	0	3	0	1908	Camden, N. J
C. B. C	do	1.00	20	4	6	0	3	0	1910	Galveston, Tex
Commodore	do	1.00	23	4	6	0	3	2	1910	do
Bully	do	1.00	20	6	5	8	3	0	1910	do
Snapshot	do	1.00	18	0	6	0	3	6	1910	do
Spry	do	1.00	20	0	6	0	3	6	1909	Houston, Tex
Derrick barge No. 1	Derrick barge	115.34	65	0	27	0	5	6	1908	Galveston, Tex
Derrick barge No. 2	do	65.00	64	0	22	0	7	0	1907	Lockport, La
Derrick barge No. 3[1]	do	45.00	54	0	22	0	3	8	1902	Galveston, Tex
Quarter boat No. 1	Quarter boat	80.68	60	8	28	7	7	6	1907	do
D. 1	Dump scow (capacity 99.5 cubic yards).	65.00	50	0	22	0	7	0	1907	Lockport, La
D. 3	do	65.00	50	0	22	0	7	0	1907	do
D. 4	Oil and water barge [2]	40.68	50	0	20	0	5	6	1908	Seabrook, Tex
D. 5	do [3]	144.00	80	0	28	0	8	0	1908	Galveston, Tex

GRAND RAPIDS, MICH.

Name or number.	Class and description.	Dis-placement.	Length Ft.	Length in.	Beam Ft.	Beam in.	Depth Ft.	Depth in.	When.	Where.
Meade, Gen. G. G	Seagoing hopper dredge.	2,596.00	177	0	38	0	19	0	1904	Sparrows Point, Md.
Ludlow, Gen	Hydraulic pipe line dredge.	190.00	162	1	36	9	4	0	[4]1904	Grand Haven, Mich.
Farquhar, Col	Dipper dredge		76	0	24	0	6	0	1869	do
Gillmore, Gen	Steam tug	[5]47.00	61	6	15	0	4	10	[6]1889	Chicago, Ill
Bertha S	Gasoline launch	[5]4.70	33	0	6	6	2	0	1897	Grand Rapids, Mich.
Engineer	do	[5]10.00	37	6	7	8	3	0	1902	do
Ludington	do	[5]1.47	22	0	5	0	2	2½	1909	do
Messenger	do	[5]1.33	17	6	5	5	2	3	[9]1907	
Saginaw	Conveyor	92.00	83	9	32	0	6	7	[10]1891	Saginaw, Mich

[1] Formerly barge Pigmy.
[2] Capacity: Oil, 295 barrels; water, 225 barrels.
[3] Capacity: Oil, 833 barrels; water, 1,107 barrels.
[4] Built by United States.
[5] Measured tonnage: Displacement not known.

employed in the Engineer Department at Large on June 30, 1911—Continued.

GALVESTON, TEX.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1905	Camden, N. J.	Wood.	$871.00	$1,080.00	Good.	Galveston Harbor.	Improving harbor, Galveston, Tex.
		do.	558.24	500.00	do.	Galveston, Tex.	Galveston Channel (dredge Miller).
		do.	884.06	800.00	do.	do.	Improving harbor, Galveston, Tex.
		do.	610.50	550.00	do.	Guadalupe River, Tex.	Improving inland waterway on coast of Texas (Guadalupe River).
		do.	325.00	100.00	Poor.	Galveston, Tex.	Improving harbor, Galveston, Tex.
		do.	450.00	350.00	Good.	Wilmington, N.C.	Do.
		do.	8,800.00	7,200.00	do.	Guadalupe River.	Improving Galveston ship channel and Buffalo Bayou, Tex.
		do.	3,316.00	2,700.00	do.	do.	Galveston ship channel and Buffalo Bayou.
		do.	3,382.00	1,350.00	do.	Galveston channel.	Reconstruction and repair of fortifications, Galveston, Tex.
		do.	3,578.22	2,700.00	do.	Aransas Pass to Pass Cavallo.	Improving inland waterway on coast of Texas.
		do.	3,316.00	2,700.00	do.	Galveston ship channel and Buffalo Bayou.	Improving Galveston channel and Buffalo Bayou, Tex.
		do.	3,316.00	2,700.00	do.	Guadalupe River, Tex.	Do.
		do.	2,015.00	1,575.00	do.	Aransas Pass to Pass Cavallo.	Improving inland waterway on coast of Texas.
		do.	7,500.00	6,300.00	do.	Harbor at Galveston, Tex.	Improving harbor, Galveston, Tex.

GRAND RAPIDS, MICH.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Steel.	$177,958.00	$162,000.00	Good.	Harbors east shore Lake Michigan.	Harbors east shore Lake Michigan.
		do.	49,300.00	39,000.00	do.	Grand River, Mich.	Grand River, Mich.
		Wood.	15,500.00	2,000.00	Unserviceable.	do.	Harbors east shore Lake Michigan.
1889	Chicago, Ill.	do.	[7] 7,500.00 [8] 5,000.00	3,000.00	Serviceable.	do.	Do.
1897	Grand Rapids, Mich.	do.	900.00	400.00	do.	do.	Grand River, Mich.
		do.	1,600.00	800.00	do.	do.	Do.
1909	Grand Rapids, Mich.	do.	426.00	350.00	Good.	Ludington, Mich.	Ludington, Mich.
		do.	250.00	200.00	do.	Harbors east shore Lake Michigan.	Harbors east shore Lake Michigan.
1891	Saginaw, Mich.	do.	16,000.00	6,000.00	do.	Grand River, Mich.	Grand River, Mich.

[6] Rebuilt at Grand Haven, Mich., 1906.
[7] First cost.
[8] Rebuilding.
[9] Converted from a rowboat at Muskegon.
[10] Rebuilt from dredge to conveyor at Grand Haven, Mich., 1906.

TABLE VI.—*Statement of floating plant owned by the United States and*

GRAND RAPIDS, MICH.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
Pile driver	Jet pile driver		100 0	24 0	2 0	1897	Ludington, Mich.
Pile driver	G. R. No. 1		40 0	20 0	3 0	1897	do
Deck scow C. 1	Quarter-boat scow	37.50	70 0	20 0	3 7	(2)	St. Joseph, Mich.
Deck scow S. 2	Stone scow	41.00	50 0	24 0	4 0	1890	Michigan City, Ind.
Deck scow S. 3	do	77.70	93 7	24 0	4 0	1903	Grand Haven, Mich.
Deck scow S. 4	do	41.00	50 0	24 0	4 0	1908	do
Deck scow G. R. 2	Deck scow	26.80	50 0	20 0	3 0	1897	Ludington, Mich.
Deck scow No. 7	do	87.50	77 0	20 4	7 0	(2)	(2)
GUANTANAMO BAY, CUBA.							
Frolic	Screw steamer	44.00	68 8	16 9	5 0	1905	Croton, N. Y.
Pioneer	Self-propelling steam lighter.	200.00	90 0	28 0	7 6	1905	Jacksonville, Fla.
HONOLULU, HAWAII.							
Melanocthon	Barge	283.00	133 0	30 5	10 9	1867	North Bend, Oreg.
Wiki	Flat	100.00	60 0	25 0	6 0	1908	Pearl Harbor
Hilo	Motor launch	8.50	35 0	7 6	4 6	1911	Seattle, Wash.
JACKSONVILLE, FLA.							
St. Johns	Seagoing hopper dredge	1,047.00	191 6	41 0	20 0	1905	Greenport, L. I.
Key West	do	498.73	131 0	31 7	15 0	1904	Belfast, Me.
Jacksonville	Hydraulic pipe line dredge.	680.00	137 4	40 8	10 2	1903 1904	Jacksonville, Fla.
Florida	Self-propelling dredge and snagboat.	371.00	152 0	29 9	7 0	1904 1905	do
Kissimmee [5]	Stationary dredge, converted to snagboat.	65.00	60 0	18 0	4 0	1903	Kissimmee, Fla.
Hillsboro	Screw steamer	28.41	89 0	14 6	6 5	1889	City Island, N. Y.
Captain Maguire	Gasoline tunnel screw	49.00	67 0	17 7	4 2	1897	Palatka, Fla.
Enif	Naphtha launch	7.00	30 0	7 6	4 6	1899	South Boston, Mass.
Violetta	do	8.00	31 0	11 4	4 4	1892	Brooklyn, N. Y.
Lunette	do	3.00	20 0	5 6	3 6	1906	Tampa, Fla.
Freak	do	5.00	27 0	8 0	3 3	1909	Bradentown, Fla.
Hyacinth Elevator	Double hull float with gas engine and elevator.	17.50	30 0	26 5	3 5	1909	Jacksonville, Fla.
De Soto [6]	Motor launch	14.00	57 6	10 7	5 1	1905	New York N. Y.

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[1] Machinery, purchased in 1889, at Chicago, Ill.; hull, purchased in 1897, at Ludington, Mich.

[2] Unknown.

[3] Repaired before going to Habana.

employed in the Engineer Department at Large on June 30, 1911—Continued.

GRAND RAPIDS, MICH.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
[1]1889 [1]1897		Wood.	$5,500.00	$500.00	Serviceable.	Grand River, Mich.	Grand River, Mich.
1897	Ludington, Mich.	...do...	410.00	100.00	...do...	.....do..........	Do.
			(³)	100.00	...do...	.....do..........	St. Joseph, Mich.
		...do...	1,250.00	100.00	...do...	.....do..........	Grand River, Mich.
		...do...	1,000.00	200.00	...do...	.....do..........	Do.
		...do...	1,250.00	100.00	...do...	.....do..........	Do.
1897	Ludington, Mich.	...do...	550.00	5.00	Unserviceable.	.....do..........	Do.
1891	Saginaw, Mich..	...do...	2,000.00	10.00	...do...	.....do..........	Harbors east shore Lake Michigan.

GUANTANAMO BAY, CUBA.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1906	New York, N. Y.	Wood.	$6,275.00	$100.00	Bad...	Guantanamo Bay, Cuba.	Fortifications in insular possessions (seacoast batteries).
1905	Guantanamo Bay, Cuba.	Yellow pine.	16,000.00	500.00	...do⁵..	Used by Board of Engineers, Habana, Cuba.	Do.

HONOLULU, HAWAII.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1908	Honolulu, Hawaii.	Wood.	$4,000.00	$1,200.00	Poor..	Between Honolulu and Pearl Harbor, Hawaii.	Fortifications in insular possessions, seacoast batteries in Hawaiian Islands.
	(⁴)	...do...	2,000.00	1,800.00	Good .	.....do..........	Do.
1911	Seattle, Wash...	...do...	2,860.00	2,860.00	New..	Kahului, Maui, and Hilo, Hawaii.	River and harbor works.

JACKSONVILLE, FLA.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
		Wood.	$195,000.00	$180,000.00	Good..	St. Johns River, Fla.	St. Johns River, Fla.
		...do...	90,000.00	65,000.00	Poor..	Undergoing repairs at Jacksonville, Fla.	Key West Harbor, Fla.
		...do...	100,000.00	60,000.00	...do...	Wilmington, N. C.	St. Johns River, Fla.
		Steel..	80,000.00	65,000.00	Fair...	St. Johns River, Fla.	River and harbor works, Florida district.
		Wood.	1,800.00	1,400.00	Good..	Kissimmee and Caloosahatchee Rivers, Fla.	Kissimmee River, Fla.
1900	New York, N. Y.	...do...	10,250.00	2,000.00	Hull very poor.	St. Johns River, Fla.	River and harbor works, Florida district.
1902	Palatka, Fla.....	...do...	5,000.00	4,000.00	Good	.....do..........	Do.
1899	Boston, Mass....	...do...	1,700.00	900.00	Fair...	.....do..........	St. Johns River, Fla.
		...do...	1,000.00	1,100.00	...do...	Tampa Bay, Fla.	Do.
1907	Tampa, Fla......	...do...	730.00	350.00	...do...	St. Johns River, Fla.	Kissimmee River, Fla.
		...do...	530.00	450.00	...do...	Caloosahatchee River, Fla.	Do.
		...do...	2,250.00	2,100.00	...do...	St. Johns River, Fla.	St. Johns River, Fla.
1911	New York, N. Y.	...do...	7,500.00	7,500.00	Good..	Tampa Bay, Fla.	Hillsboro Bay, Fla.

[4] Built by United States.
[5] New house built and arranged for snagging only; rebuilt in 1908.
[6] Formerly the yacht Gunedmertrix.

TABLE VI.—*Statement of floating plant owned by the United States and*

KANSAS CITY, MO.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Mandan	Stern-wheel snag boat	150.00	138	0	24	0	4	7	1891	St. Louis, Mo
McPherson, James B.	do	340.00	170	0	36	0	5	7	1891	Dubuque, Iowa
Missouri	Side-wheel snag boat	510.00	187	0	52	0	7	0	1888	Pittsburgh, Pa
Arethusa	Steam tender	45.00	91	0	18	4	4	8	1894	Gasconade, Mo
Gasconade	Stern-wheel towboat (gasoline).	10.00	48	10	12	0	2	6	1911	do
Osage	do	14.40	60	0	14	0	2	7	1897	Great Falls, Mont
Bonne Femine [2]	Motor launch		24	8	5	6	2	5	1908	Grafton, Ill
Enquirer	do		30	4	7	0	3	0	1897	Long Island City, N. Y.
Moreau	do		20	0	5	1	2	1	1910	Grafton, Ill
Sioux [3]	do		20	0	5	0	2	3	1909	do
VII-Y	Pile driver		60	8	18	0	4	0	1899	Sioux City, Iowa
I	Pile driver, flat bottom		76	0	19	0	4	6	1909	Gasconade, Mo
I-B	do		56	0	18	0	4	0	1895	Bismarck, N. Dak
15	do		76	3	18	4	4	4	1883	St. Louis, Mo
No. 1 (from barge 159)	Quarter boat, flat bottom.		100	0	20	0	5	0	1910	Rock Island, Ill
A (on barge 2a)	do		72	0	20	0	2	6	1905	Gasconade, Mo
B (on barge 3a)	do		72	0	20	0	2	6	1905	do
No. 14	Mattress boat		70	4	25	3	2	9	1894	do
No. 1	do		80	0	30	0	4	0	1909	do
No. 2	do		80	0	30	0	4	0	1909	do
No. 6	Ponton, flat bottom		22	0	7	0	2	0	1900	do
No. 7	do		22	0	7	0	2	0	1900	do
No. 8	do		22	0	7	0	2	0	1900	do
No. 12	do		19	6	8	0	2	0	1909	do
No. 13	do		19	6	8	0	2	0	1909	do
No. 14	do		19	6	7	0	2	0	1900	do
No. 1 (on barge No. 2)	Boat, power		70	0	18	0	4	0	1897	do
No. 101 (with quarters on).	Barge, flat bottom		62	0	16	0	3	0	1893	Jeffersonville, Ind
No. 141	do		100	0	25	0	5	4	1899	Gasconade, Mo
No. 142	do		100	0	25	0	5	4	1899	do
No. 143	do		100	0	25	0	5	4	1900	do
No. 144	do		100	0	25	0	5	4	1900	do
No. 145	do		100	0	25	0	5	4	1900	do
No. 146	do		100	0	25	0	5	4	1900	do
No. 147	do		100	0	25	0	5	4	1900	do
No. 148	do		100	0	25	0	5	4	1900	do
No. 149	do		100	0	25	0	5	4	1900	do
No. 150	do		100	0	25	0	5	4	1900	do
No. 151	do		100	0	25	0	5	4	1900	do
No. 152	do		100	0	25	0	5	4	1900	do
No. 153	do		100	0	20	0	5	0	1910	Rock Island, Ill
No. 154	do		100	0	20	0	5	0	1910	do

[1] Being rebuilt. [2] Formerly the Missouri. [3] Formerly the McPherson. [4] Hull.

employed in the Engineer Department at Large on June 30, 1911—Continued.

KANSAS CITY, MO.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Steel	$21,500.00	$18,000.00	Good	Upper Missouri River.	Upper Missouri River.
		do	45,500.00	32,000.00	do	Upper and lower Missouri River.	Do.
		do	115,000.00	100,000.00	do	Lower Missouri River.	Lower Missouri River.
		Wood	10,000.00	4,000.00	Fair	St. Joseph, Mo	Do.
		do	2,675.00	2,675.00	Good	Gasconade River.	Do.
		do	2,500.00	(1)	Unserviceable.	Osage River	Do.
1908	Grafton, Ill	Steel	484.00	400.00	Good	With snag boat Missouri.	Do.
1897	Long Island City, N. Y.	Wood	2,300.00	200.00	Fair	Osage River	Do.
1910	Grafton, Ill	Steel	388.50	388.50	Good	With snag boat Mandan.	Upper Missouri River.
1909	do	do	387.00	350.00	do	With snag boat McPherson.	Lower Missouri River.
		Wood	3,400.00	100.00	Bad	Lower Missouri River.	Upper Missouri River.
		do	1,555.38	2,500.00	Good	do	Lower Missouri River.
		do	2,500.00	1,000.00	Fair	Rockhaven, N. Dak.	Upper Missouri River.
1883	St. Louis, Mo	do	1,980.00	1,500.00	Good	Lower Missouri River.	Lower Missouri River.
1910	Rock Island, Ill.	do	[4] 1,910.00 [5] 1,390.00	[6] 33,300.00	do	do	Do.
		do	[4] 835.00	1,000.00	Fair	Gasconade River.	Gasconade River.
		do	[4] 835.00	500.00	do	do	Do.
		do	1,200.00		Bad	Lower Missouri River.	Lower Missouri River.
		do	1,974.42	1,500.00	Good	do	Do.
		do	1,974.42	1,500.00	do	St. Joseph, Mo	Do.
		do	75.00	15.00	Fair	do	Do.
		do	75.00	15.00	do	do	Do.
		do	75.00	10.00	do	Lower Missouri River.	Do.
		do	73.00	50.00	Good	do	Do.
		do	73.00	50.00	do	do	Do.
		do	73.00	50.00	do	do	Do.
(7)		do	691.00	[8] 3,000.00	do	Gasconade River.	Gasconade River.
1893	Jeffersonville, Ind.	do	1,188.00	600.00	Poor	St. Joseph, Mo	Lower Missouri River.
		do	2,815.00		Unserviceable.	Osage River	Do.
		do	2,815.00	1,300.00	Good	Lower Missouri River.	Do.
		do	2,815.00		Unserviceable.	Osage River	Do.
		do	2,815.00	500.00	Fair	do	Do.
		do	2,815.00	1,300.00	Good	Lower Missouri River.	Do.
		do	2,815.00	1,300.00	Good	do	Do.
		do	2,815.00	1,300.00	do	do	Do.
		do	2,815.00	1,200.00	Fair	St. Joseph, Mo	Do.
		do	2,815.00	500.00	do	Osage River	Do.
		do	2,815.00	1,200.00	do	St. Joseph, Mo	Do.
		do	2,815.00	1,200.00	do	do	Do.
		do	2,815.00	1,200.00	do	do	Do.
1910	Rock Island, Ill.	do	1,500.00	1,300.00	Good	Lower Missouri River.	Do.
1910	do	do	1,500.00	1,300.00	do	St. Joseph, Mo	Do.

[5] Quarters. [6] With quarters. [7] Rebuilt, 1910. [8] With steam plant.

TABLE VI.—*Statement of floating plant owned by the United States and*

KANSAS CITY, MO.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft*	*in.*	*Ft.*	*in.*		
No. 155	Barge, flat-bottom		100	0	20	0	5	0	1910	Rock Island, Ill
No. 156	do		100	0	20	0	5	0	1910	do
No. 157	do		100	0	20	0	5	0	1910	do
No. 158	do		100	0	20	0	5	0	1910	do
No. 160	do		100	0	20	0	5	0	1910	do
III-S	do		70	0	20	0	5	0	1897	Sioux City, Iowa
V-S (pile driver)	do		65	0	19	0	4	6	1885	Bismarck, N. Dak
IV-S	do		70	0	19	0	5	0	1897	Sioux City, Iowa
I-EP	do		69	7	19	10	5	0	1890	Fort Benton, Mont
II-EP	do		69	5	19	10	5	0	1899	do
III-EP	do		70	0	19	11	5	0	1899	Sioux City, Iowa
IV-EP (grader)	do		70	0	19	10	5	0	1899	do
V-Y (cook boat)	do		64	0	16	0	3	0	1899	do
VI-Y	do		70	0	19	10	5	0	1899	do
VII-P	do		70	0	20	0	4	4	1897	Pierre, S. Dak
III-B	do		100	0	24	0	4	5	1897	Bismarck, N. Dak
IV-B	do		70	0	19	0	4	5	1897	do
IX-B	do		80	0	20	0	4	0		
X-B	do		80	0	20	0	4	0		
No. 1	do		100	0	25	0	4	0	1911	Gasconade, Mo
No. 3	do		72	0	20	0	4	0	1905	Osage River
No. 4	do		72	0	20	0	4	0	1905	do
No. 6	do		72	0	20	0	5	0	1909	do
No. 4	Skiff		26	8	6	8			1893	Gasconade, Mo
No. 6	do		15	0	3	6			1896	St. Louis, Mo
No. 16	do		17	0	6	4			1893	Gasconade, Mo
No. 59	do		17	6	4	6			1893	do
No. 62	do		22	0	4	9			1904	do
No. 63	do		22	0	4	8			1904	do
No. 64	do		16	0	4	5	1	4	1909	do
No. 65	do		20	0	4	4	1	6	1909	do
No. 66	do		16	0	4	0	1	4	1909	do
No. 67	do		20	0	4	7	1	6	1909	do
No. 68	do		20	0	4	7	1	6	1909	do
No. 69	do		20	0	4	7	1	6	1909	do
No. 70	do		20	0	4	7	1	6	1909	do
No. 71	do		20	0	4	7	1	6	1909	do
No. 72	do		20	0	4	4	1	6	1909	do
No. 73	do		20	0	4	7	1	6	1909	do
No. 74	do		20	0	4	4	1	6	1909	do
No. 75	do		20	0	4	4	1	6	1909	do
No. 76	do		20	0	4	4	1	6	1909	do
III-S	do		20	0	4	7	1	4	1897	Sioux City, Iowa
IV-S	do		20	0	4	10	1	4	1897	do
I-B	do		18	0	4	4	1	7	1895	Stillwater, Minn
No. 101	do		18	0						do
McPherson No. 2	do		20	0	4	4	1	5	1899	do
McPherson	Yawl		26	0	6	4	1	7	1895	Jeffersonville, Ind
Missouri	do		26	0	5	9			1907	New York, N. Y

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[1] With machinery.

employed in the Engineer Department at Large on June 30, 1911—Continued.

KANSAS CITY, MO.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1910	Rock Island, Ill.	Wood.	$1,500.00	$1,300.00	Good..	Lower Missouri River.	Lower Missouri River.
1910	.....do	...do...	1,500.00	1,300.00	...do...	.....do	Do.
1910	.....do	...do...	1,500.00	1,300.00	...do...	St. Joseph, Mo...	Do.
1910	.....do	...do...	1,500.00	1,300.00	...do...	Lower Missouri River.	Do.
1910	.....do	...do...	1,500.00	1,300.00	...do...	.....do	Do.
		...do...	625.00	200.00	Fair...	.....do	Upper Missouri River.
		...do...	999.25	[1] 800.00	...do...	Sioux City, Iowa.	Do.
		...do...	625.00	100.00	Bad...	.....do	Do.
		...do...	840.00	175.00	...do...	.....do	Do.
		...do...	840.00	175.00	...do...	.....do	Do.
		...do...	840.00	175.00	...do...	.....do	Do.
		...do...	840.00	200.00	Fair...	Lower Missouri River.	Do.
		...do...	840.00	8.00	Poor..	St. Joseph, Mo...	Do.
		...do...	840.00	300.00	Fair...	Osage River	Do.
		...do...	720.00	100.00	...do...	Pierre, S. Dak....	Do.
		...do...	950.00	50.00	Bad...	Rockhaven, N. Dak.	Do.
		...do...	650.00	50.00	...do...	.....do	Do.
1906	Bismarck, N. Dak.	...do...	532.00	375 00	Good..	.....do	Do.
1906	.....do	...do...	532.00	375.00	...do...	.....do	Do.
		...do...	2,300.00	2,300.00	...do...	Gasconade River.	Gasconade River.
		...do...	937.00	500.00	Fair...	Osage River	Osage River.
		...do...	937.00	500.00	...do...	.....do	Do.
		...do...	1,200.00	700.00	...do...	.....do	Do.
		...do...	35.00		Unserviceable.	.....do	Lower Missouri River.
		...do...	35.00	5.00	Poor..	Gasconade River.	Gasconade River.
		...do...	25.00		Unserviceable.	Lower Missouri River.	Lower Missouri River.
		...do...	25.00		...do...	.....do	Do.
		...do...	66.00		...do...	.....do	Do.
		...do...	66.00		...do...	.....do	Do.
		...do...	32.00	20.00	Good..	.....do	Do.
		...do...	35.00	22.00	...do...	.....do	Do.
		...do...	32.00	20.00	...do...	.....do	Do.
		...do...	37.00	23.00	...do...	.....do	Do.
		...do...	37.00	23.00	...do...	With snag boat Mandan.	Do.
		...do...	37.00	23.00	...do...	Lower Missouri River.	Do.
		...do...	37.00	25.00	...do...	St. Joseph, Mo...	Do.
		...do...	37.00	25.00	...do...	.....do	Do.
		...do...	35.00	25.00	...do...	.....do	Do.
		...do...	35.00	22.00	...do...	.....do	Do.
		...do...	35.00	22.00	...do...	Lower Missouri River.	Do.
		...do...	35.00	22.00	...do...	.....do	Do.
		...do...	35.00	25.00	...do...	St. Joseph, Mo...	Do.
		...do...	40.00	10.00	Fair...	Lower Missouri River.	Upper Missouri River.
		...do...	40.00	5.00	Poor..	Sioux City, Iowa.	Do.
1895	Stillwater, Minn.	...do...	45.00		Unserviceable.	Rockhaven, N. Dak.	Do.
1910	Glendive, Mont.	...do...	28.00	22.00	Good..	Williston, N. Dak.	Do.
1899	Stillwater, Minn.	...do...	42.00	12.00	Fair...	With snag boat McPherson.	Do.
1899	Jeffersonville, Ind.	Steel..	160.00	35.00	...do...	.....do	Do.
1907	New York, N. Y.	...do...	250.00	200.00	Good..	With snag boat Missouri.	Lower Missouri River.

TABLE VI.—*Statement of floating plant owned by the United States and*

LITTLE ROCK, ARK.

Name or number.	Class and description.	Dis-placement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	Ft. in.	Ft. in.	Ft. in.		
Dredge No. 68 [1]	Dipper dredge	200.00	100 0	34 0	6 0	1904	Batesville, Ark.
C. B. Reese	Steam stern-wheel snag boat.	340.00	171 6	36 0	5 3	1879	Carondelet, Mo.
Arkansas	do	235.00	140 0	30 0	4 6	1900	Jeffersonville, Ind.
Quapaw	do	240.00	128 0	30 0	4 4	1902 1903	do. Little Rock, Ark.
A. B. Johnson	Hand-propelled snag boat	48.00	84 0	22 0	3 0	1904	Madison, Ark.
Riverside	do	57.00	84 0	22 0	3 0	1904	Poplar Bluff, Mo.
A. D. Allen	Stern-wheel towboat	145.00	125 0	25 0	4 5	[2] 1901	Jeffersonville, Ind.
Quarter boat No. 1	Complete quarters	104.00	100 0	20 0	4 0	1908	Batesville, Ark.
Derrick boat No. 2	Decked scow	61.00	60 0	26 0	4 0	1901	do.
Inspector No. 1	Gasoline launch	3.00	25 0	4 6	2 6	1908	Grafton, Ill.
Barge, 7-07	Decked scow (170 tons)		100 0	20 0	5 0	1907	Batesville, Ark.
Barge, 8-07	do		100 0	20 0	5 0	1907	do.
Barge, 9-07	do		100 0	20 0	5 0	1907	do.
Barge, 10-07	do		100 0	20 0	5 0	1907	do.
Barge, 11-09	Decked scow (185 tons)		114 6	24 0	4 0	1907	Little Rock, Ark.

LOS ANGELES, CAL.

Name or number.	Class and description.	Dis-placement.	Length.	Beam.	Depth.	When.	Where.
San Pedro	20-inch hydraulic pipe-line dredge.	900.00	140 8	40 8	10 7	1904	San Pedro, Cal.
Pedrito	16-horsepower gasoline launch.	5.00	26 0	7 0	3 4	1904	do.
No. 1	Work barge	41.50	34 6	12 0	4 6	1905	do.
No. 2	Barge	57.10	40 0	18 0	3 2	1872	do.
No. 3	do	63.50	40 8	17 0	3 8	1872	do.
No. 4	Derrick barge	20.30	29 6	10 0	3 10	1904	do.
No. 8	Oil barge	34.40	34 9	10 0	4 6	1904	do.
No. 9	Water barge	34.40	34 9	10 0	4 6	1904	do.
No. 10	Pontoon	13.40	21 3	10 0	3 0	1904	do.
No. 12	do	13.40	21 3	10 0	3 0	1904	do.
No. 14	do	13.40	21 3	10 0	3 0	1904	do.
No. 16	do	13.40	21 3	10 0	3 0	1904	do.
No. 18	do	13.40	21 3	10 0	3 0	1904	do.
No. 20	do	13.40	21 3	10 0	3 0	1904	do.
No. 22	do	13.40	21 3	10 0	3 0	1904	do.
No. 24	do	13.40	21 3	10 0	3 0	1904	do.
No. 26	do	13.40	21 3	10 0	3 0	1904	do.
No. 28	do	13.40	21 3	10 0	3 0	1904	do.
No. 30	do	13.40	21 3	10 0	3 0	1904	do.
No. 32	do	13.40	21 3	10 0	3 0	1904	do.
No. 33	do	13.40	21 3	10 0	3 0	1905	do.
No. 34	do	13.40	21 3	10 0	3 0	1904	do.
No. 35	do	13.40	21 3	10 0	3 0	1905	do.
No. 36	do	13.40	21 3	10 0	3 0	1904	do.
No. 38	do	13.40	21 3	10 0	3 0	1904	do.
No. 11	do	21.40	35 0	10 0	3 0	1904	do.
No. 13	do	21.40	35 0	10 0	3 0	1904	do.
No. 15	do	21.40	35 0	10 0	3 0	1904	do.
No. 17	do	21.40	35 0	10 0	3 0	1904	do.
No. 19	do	21.40	35 0	10 0	3 0	1904	do.
No. 21	do	21.40	35 0	10 0	3 0	1904	do.
No. 23	do	21.40	35 0	10 0	3 0	1904	do.
No. 25	do	21.40	35 0	10 0	3 0	1904	do.
No. 27	do	21.40	35 0	10 0	3 0	1904	do.
No. 29	do	21.40	35 0	10 0	3 0	1904	do.
No. 31	do	21.40	35 0	10 0	3 0	1904	do.
No. 7	Water boat	10.00	28 8	8 8	2 6	1888	do.

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[1] Formerly dredge Van Frank.

[2] Estimate does not include value of machinery from old boat.

employed in the Engineer Department at Large on June 30, 1911—Continued.

LITTLE ROCK, ARK.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$14,413.00	$6,000.00	Poor..	Upper White River, Ark.	Little Rock district, Ark.
......	....	Iron and steel.	72,325.20	17,500.00	Fair...	Arkansas and White Rivers.	Do.
......	....	Steel..	23,138.87	11,000.00	...do...	.....do..........	Do.
......	....	Wood.	15,000.00	10,000.00	...do...	White, Black, and Current Rivers.	Do.
......	....	...do...	[3] 2,731.26	1,500.00	...do...	St. Francis River.	Do.
......	....	...do...	[3] 2,900.00	1,400.00	...do...	Black and Current Rivers.	Do.
1910	Little Rock, Ark.	...do...	Unknown.	5,500.00	...do...	Upper White River, Ark.	Do.
......	....	...do...	4,217.00	3,000.00	...do...	.....do..........	Do.
......	....	...do...	[3] 1,065.00	600.00	...do...	.....do..........	Do.
1908	Grafton, Ill......	Steel..	750.00	300.00	...do...	.....do..........	Do.
......	....	Wood.	1,917.00	850.00	...do...	.....do..........	Do.
......	....	...do...	1,917.00	850.00	...do...	.....do..........	Do.
......	....	...do...	1,917.00	850.00	...do...	.....do..........	Do.
......	....	...do...	1,917.00	850.00	...do...	.....do..........	Do.
1909	Pine Bluff, Ark.	...do...	1,750.00	500.00	...do...	.....do..........	Do.

LOS ANGELES, CAL.

......	....	Pine..	$98,400.00	$53,136.00	Good..	Los Angeles Harbor, Cal.	Improving Los Angeles Harbor, Cal.
......	....	Oak, pine, and cedar.	1,732.50	935.00	...do..	.....do..........	Do.
......	....	Pine..	373.25	235.00	...do..	.....do..........	Do.
......	....	...do..	750.00	16.00	Bad...	.....do..........	Do.
......	....	...do..	750.00	16.00	...do..	.....do..........	Do.
......	....	...do..	377.70	205.00	Good..	.....do..........	Do.
......	....	...do..	297.40	160.00	...do..	.....do..........	Do.
......	....	...do..	297.40	160.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	223.70	141.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	223.70	141.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	292.78	158.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	192.87	104.00	...do..	.....do..........	Do.
......	....	...do..	400.00	8.00	Bad...	.....do..........	Do.

[3] Rebuilt 1907.

TABLE VI.—*Statement of floating plant owned by the United States and*

LOUISVILLE, KY.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
Casey	Combination hydraulic and dipper dredge.	163.40	86 0	28 0	6 6	1907	Louisville, Ky
Louisville	Dipper dredge	127.60	67 0	28 0	6 0	1886	Cincinnati, Ohio
Green River	do	268.00	112 0	31 0	4 0	1896	Spottsville, Ky
Wabash	do	126.00	81 0	26 0	6 0	1900	Louisville, Ky
Mammoth Cave	Stern-wheel snag boat	284.00	124 0	32 0	5 0	1908	Jeffersonville, Ind
Cherokee	Stern-wheel steamboat	169.00	124 6	26 0	4 0	[4] 1887	do
Shawnee	do	172.00	119 0	25 0	4 6	1897 1909	do Louisville, Ky
Emerald	do	30.00	65 6	12 0	3 0	1899	Cincinnati Ohio
Wave Rock	do	25.00	55 0	12 0	2 1	1898	Louisville, Ky
Echo River	Gasoline launch	4.00	39 8½	7 5	3 2	1911	do
John Phoenix	do	1.00	28 0	5 0	2 3	1909	do
No. 1, G. and B. (old)	100 cubic yard dump scow.	(5)	70 0	21 0	5 6	1902	Elizabeth, Pa
No. 2, G. and B. (old)	do	(5)	70 0	21 0	5 6	1902	do
No. 1, G. and B. (new)	do	(5)	70 0	21 0	5 6	1910	Louisville, Ky
No. 2, G. and B. (new)	do	(5)	70 0	21 0	5 6	1910	do
No. 5, L. P. C.	do	(5)	85 0	24 0	6 0	1898	Elizabeth, Pa
No. 6, L. P. C.	do	(5)	85 0	24 0	6 0	1898	do
No. 9, L. P. C.	do	(5)	85 0	24 0	6 0	1902	do
No. 10, L. P. C.	do	(5)	85 0	24 0	6 0	1902	do
No. 11, L. P. C.	do	(5)	85 0	24 0	6 0	1905	do
No. 12, L. P. C.	do	(5)	85 0	24 0	6 0	1905	do
No. 13, L. P. C.	do	(5)	85 0	24 0	6 0	1905	do
No. 14, L. P. C.	do	(5)	85 0	24 0	6 0	1905	do
No. 15, L. P. C.	do	(5)	85 0	24 0	6 0	1909	Louisville, Ky
No. 16, L. P. C.	do	(5)	85 0	24 0	6 0	1909	do
No. 1, G. and B.	Derrick boat	76.00	70 0	26 0	4 0	1910	Woodbury, Ky
No. 2, G. and B.	do	76.00	70 0	26 0	4 0	1910	do
No. 3, G. and B.	do	76.00	70 0	26 0	4 0	1906	Green Castle, Ky
No. 5, L. P. C.	do	57.00	72 0	22 0	4 0	1899	Louisville, Ky
No. 1, G. and B.	150-ton barge	60.00	100 0	20 0	5 0	1896	Spottsville, Ky
No. 2, G. and B.	do	60.00	100 0	20 0	5 0	1896	do
No. 3, G. and B.	200-ton barge	73.00	100 0	22 0	6 0	1907	Louisville, Ky
No. 4, G. and B.	do	73.00	100 0	22 0	6 0	1907	do
No. 2, L. P. C.	80-ton barge	40.00	71 6	22 0	4 0	1895	Leavenworth, Ind
No. 4, L. P. C.	do	41.00	72 6	22 0	4 0	1900	do
No. 8, L. P. C[7]	10-ton barge	9.00	40 0	12 0	2 0	1898	Louisville, Ky
No. 10, L. P. C.	35-ton barge	31.00	80 0	16 0	3 0	1898	do
No. 11, L. P. C.	10-ton barge	9.00	40 0	12 0	2 0	1904	do
No. 12, L. P. C[8]	do	9.00	40 0	12 0	2 0	1904	do
No. 14, L. P. C.	35-ton barge	28.00	60 0	18 0	2 4	1908	do
No. 15, L. P. C.	do	28.00	60 0	18 0	2 4	1908	do
No. 16, L. P. C.	200-ton barge	91.00	90 11½	24 8	6 0	1908	Ambridge, Pa
No. 17, L. P. C.	do	91.00	90 11½	24 8	6 0	1908	do
No. 18, L. P. C.	35-ton barge	28.00	60 0	18 0	2 4	1910	Louisville, Ky
No. 19, L. P. C.	do	28.00	60 0	18 0	2 4	1910	do
No. 1	Drill boat	10.00	40 0	14 0	2 8	1909	do
No. 2	do	10.00	40 0	14 0	2 8	1909	do
No. 3	do	10.00	40 0	14 0	2 8	1909	do

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[1] Built by United States.

[2] Rebuilt by United States; hull repaired, 1908.

[3] Rebuilt by United States.

[4] Rebuilt at Louisville, Ky., 1896.

employed in the Engineer Department at Large on June 30, 1911—Continued.

LOUISVILLE, KY.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	(1)	Wood.	$15,257.13	$11,500.00	Fair...	Louisville, Ky...	Louisville & Portland Canal.
1886	Cincinnati, Ohio	Iron hull.	25,000.00	5,100.00	...do...	.....do..........	Do.
......	(2)	Wood.	4,093.69	5,500.00	...do...	Green and Barren Rivers.	Green and Barren Rivers, Ky.
......	(3)	...do...	8,526.00	3,000.00	Poor..	Louisville, Ky...	Wabash River, Ind. and Ill.
1908	Jeffersonville, Ind.	Steel hull, wood superstructure.	36,845.19	40,000.00	Good..	Green and Barren Rivers.	Green and Barren Rivers, Ky.
1887	.....do..........	Wood and iron.	16,669.00	6,700.00	Poor..	Louisville, Ky...	Louisville & Portland Canal.
......	(3)	Wood.	8,461.21	10,000.00	Good..	Green and Barren Rivers.	Green and Barren Rivers, Ky.
1899	Cincinnati, Ohio	...do...	2,975.00	2,000.00	...do...	Louisville, Ky...	Do.
......	(1)	...do...	2,066.00	1,000.00	Fair...	.....do..........	Louisville & Portland Canal.
......	(1)	...do...	2,519.68	2,500.00	Good..	Green, Barren, and Rough Rivers.	Green and Barren Rivers, Ky.
......	(1)	...do...	577.44	400.00	...do...	Louisville, Ky...	Louisville & Portland Canal.
1902	Elizabeth, Pa...	...do...	3,067.00	....	Worthless.	Green and Barren Rivers.	Green and Barren Rivers, Ky.
1902	.....do..........	...do...	3,067.00	....	...do...	.....do..........	Do.
......	(1)	...do...	3,375.00	3,000.00	Good..	.....do..........	Do.
......	(1)	...do...	3,375.00	3,000.00	...do...	.....do..........	Do.
1898	Elizabeth, Pa...	...do...	2,300.00	....	Worthless.	Louisville, Ky...	Louisville & Portland Canal.
1898	.....do..........	...do...	2,300.00	250.00	Poor..	.....do..........	Do.
1903	.....do..........	...do...	2,967.00	1,400.00	Fair...	.....do..........	Do.
1903	.....do..........	...do...	2,967.00	1,400.00	...do...	.....do..........	Do.
1905	.....do..........	...do...	3,394.00	1,900.00	...do...	.....do..........	Do.
1905	.....do..........	...do...	3,394.00	1,900.00	...do...	.....do..........	Do.
1905	.....do..........	...do...	3,394.00	1,900.00	...do...	.....do..........	Do.
1905	.....do..........	...do...	3,394.00	1,900.00	...do...	.....do..........	Do.
......	(1)	...do...	3,140.72	2,800.00	Good..	.....do..........	Do.
......	(1)	...do...	3,140.72	2,800.00	...do...	.....do..........	Do.
......	(3)	...do...	2,779.30	3,500.00	...do...	Green and Barren Rivers.	Green and Barren Rivers, Ky.
......	(3)	...do...	2,779.30	3,500.00	...do...	.....do..........	Do.
......	(1)	...do...	2,520.52	1,800.00	Fair...	.....do..........	Do.
......	(1)	...do...	3,588.98	1,700.00	Poor..	Louisville, Ky...	Louisville & Portland Canal.
......	(6)	...do...	1,911.51	1,100.00	Fair...	Green and Barren Rivers.	Green and Barren Rivers, Ky.
......	(6)	...do...	1,911.51	1,100.00	...do...	.....do..........	Do.
......	(1)	...do...	2,614.05	1,800.00	...do...	.....do..........	Do.
......	(1)	...do...	2,614.05	1,800.00	...do...	.....do..........	Do.
1896	Leavenworth, Ind.	...do...	590.00	25.00	Poor..	Louisville, Ky...	Louisville & Portland Canal.
1900	.....do..........	...do...	670.00	50.00	...do...	.....do..........	Do.
......	(1)	...do...	230.00	5.00	...do...	.....do..........	Do.
......	(1)	...do...	1,237.00	20.00	...do...	.....do..........	Do.
......	(1)	...do...	213.95	75.00	...do...	.....do..........	Do.
......	(1)	...do...	213.95	75.00	...do...	.....do..........	Do.
......	(1)	...do...	818.76	500.00	Fair...	.....do..........	Do.
......	(1)	...do...	818.77	500.00	...do...	.....do..........	Do.
1908	Ambridge, Pa...	Steel, wood deck.	7,067.19	7,000.00	Good..	.....do..........	Do.
1908	.....do..........	...do...	7,067.19	7,000.00	...do...	.....do..........	Do.
......	(1)	Wood.	823.96	823.96	...do...	.....do..........	Do.
......	(1)	...do...	823.96	823.96	...do...	.....do..........	Do.
......	(1)	...do...	396.11	350.00	...do...	Ohio River Survey.	Survey of Ohio River.
......	(1)	...do...	396.11	350.00	...do...	.....do..........	Do.
......	(1)	...do...	396.11	350.00	...do...	.....do..........	Do.

[5] Unknown.
[6] Built by the United States; hull repaired, 1908.
[7] Formerly No. 7.
[8] Formerly No. 13.

TABLE VI.—*Statement of floating plant owned by the United States and*

LOUISVILLE, KY.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 4	Drill boat	10.00	40	0	14	0	2	8	1909	Louisville, Ky
No. 9	do	10.00	40	0	14	0	2	8	1909	Clarington, Ohio
No. 10	do	10.00	40	0	14	0	2	8	1909	do
No. 11	do	10.00	40	0	14	0	2	8	1909	do
No. 12	do	10.00	40	0	14	0	2	8	1909	do
No. 13	do	10.00	40	0	14	0	2	8	1910	do
No. 14	do	10.00	40	0	14	0	2	8	1910	do
No. 15	do	10.00	40	0	14	0	2	8	1910	Louisville, Ky
No. 16	do	10.00	40	0	14	0	2	8	1910	do
No. 17	do	10.00	40	0	14	0	2	8	1910	do
No. 18	do	10.00	40	0	14	0	2	8	1910	do
No. 19	do	10.00	40	0	14	0	2	8	1910	do
No. 20	do	10.00	40	0	14	0	2	8	1910	do
No. 5	20-ton fuel boat	8.00	40	0	14	0	2	8	1909	do
No. 6	do	8.00	40	0	14	0	2	8	1909	do
No. 7	do	8.00	40	0	14	0	2	8	1910	do
No. 8	do	8.00	40	0	14	0	2	8	1910	do
No. 1, G. and B	Quarter boat	76.00	76	0	24	0	3	6	1899	Glenmore, Ky
No. 1, Ohio	do	88.00	110	0	22	0	3	6	1909	Parkersburg, W. Va.
No. 2, Ohio	do	138.00	125	6	30	0	4	6	1909	Louisville, Ky
No. 3, Ohio	do	88.00	110	0	22	0	3	6	1910	do
No. 4, Ohio	do	88.00	110	0	22	0	3	6	1910	do
No. 1, Wabash	do	20.00	46	6	16	1	2	6		(2)
No. 2, Wabash	do	22.00	57	6	16	4	3	0		(2)

MANILA, P. I.

Name or number.	Class and description.	Displacement.	Length ft.	Length in.	Beam ft.	Beam in.	Depth ft.	Depth in.	When.	Where.
Engineer	Steam tug	157.00	106	0	20	0	11	0	1907	Hongkong
San Pedro	do	112.87	92	10	20	10	10	6	1890	England
No. 2	Barge, deck	100.00	75	0	26	2	7	8½	1905	Sisiman
No. 3	do	100.00	75	0	26	2	7	8½	1907	Manila
No. 4	do	100.00	75	0	26	2	7	8½	1907	do
No. 5	Derrick barge	105.70	75	6	28	6	7	0	1905	Iloilo
No. 6	Pile driver	68.00	58	0	20	0	6	0	1908	U. S. Engineer Department, Corregidor Islands.
No. 7	Barge deck	200.00	110	0	30	0	8	0	1909	Manila
No. 8	do	200.00	110	0	30	0	8	0	1910	do
No. 9	do	200.00	110	0	30	0	8	0	1910	do
No. 1D	do	105.70	75	6	28	6	7	0	1905	Iloilo
No. 2	Scow derrick	122.50	74	0	36	0	6	0	1909	Manila
No. 1	Barge, water	65.00	55	0	20	0	5	0	1909	Navy, Cavite

MEMPHIS, TENN.

Name or number.	Class and description.	Displacement.	Length ft.	Length in.	Beam ft.	Beam in.	Depth ft.	Depth in.	When.	Where.
Minnetonka	Stern-wheel steamboat	490.00	176	5	29	9	5	4	1883	Jeffersonville, Ind
Chisca	do	450.00	160	0	30	0	5	0	1897	do
Titan	do	340.00	142	0	27	0	6	0	1889	Madison, Ind
Graham	do	138.00	118	0	21	0	3	0	1879	Pittsburgh, Pa
Itaska	do	80.00	76	0	15	0	4	0	1882	Carondelet, Mo
Beaver [2]	do	62.00	81	0	12	0	4	0	1887	do
Dry dock	Floating type		145	0	36	0	10	0	1889	Memphis, Tenn
Dump scow No. 1	Dump scow (80 cubic yards).		75	0	20	6	5	6	1900	do
Dump scow No. 2	do		75	0	20	6	5	6	1900	do

[1] Built by United States.

[2] Unknown.

employed in the Engineer Department at Large on June 30, 1911—Continued.

LOUISVILLE, KY.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
	(1)	Wood.	$396.11	$350.00	Good.	Ohio River Survey.	Survey of Ohio River.
1909	Clarington, Ohio	do.	350.00	325.00	do.	do.	Do.
1909	do.	do.	350.00	325.00	do.	do.	Do.
1909	do.	do.	350.00	325.00	do.	do.	Do.
1909	do.	do.	350.00	325.00	do.	do.	Do.
1910	do.	do.	450.00	425.00	do.	do.	Do.
1910	do.	do.	450.00	425.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	396.11	350.00	do.	do.	Do.
	(1)	do.	396.11	350.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	521.00	500.00	do.	do.	Do.
	(1)	do.	2,200.00	500.00	Fair.	Green and Barren Rivers.	Green and Barren Rivers, Ky.
1909	Parkersburg, W. Va.	do.	3,825.00	3,400.00	Good.	Ohio River survey.	Survey of Ohio River.
	(1)	Wood and iron.	1,128.63	1,400.00	Fair.	do.	Do.
	(1)	Wood.	4,649.07	4,600.00	Good.	do.	Do.
	(1)	do.	4,649.07	4,600.00	do.	do.	Do.
1911	Vincennes, Ind.	do.	250.00	300.00	do.	Wabash River survey.	Wabash River.
1911	do.	do.	600.00	600.00	do.	do.	Do.

MANILA, P. I.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1908	Hongkong	Steel.	$44,811.47	$38,000.00	Good.	Manila and Subic Bays.	Defensive works, Philippine Islands.
1909	Manila	do.	18,900.00	23,000.00	Fair.	do.	Do.
1905	do.	Wood.	3,324.00	800.00	do.	do.	Do.
1907	do.	do.	4,372.00	1,800.00	Good.	do.	Do.
1907	do.	do.	4,372.00	1,800.00	do.	do.	Do.
1909	do.	do.	3,000.00	2,600.00	do.	do.	Do.
		do.	2,500.00	800.00	Fair.	do.	Do.
1909	Manila	do.	8,069.00	7,500.00	Good.	do.	Do.
1910	do.	do.	8,069.00	7,500.00	do.	do.	Do.
1910	do.	do.	8,370.00	8,000.00	do.	do.	Do.
1909	do.	do.	3,000.00	1,600.00	do.	do.	Do.
1909	do.	do.	6,700.00	6,000.00	do.	do.	Do.
1909	Cavite	do.	3,142.29	2,500.00	do.	do.	Do.

MEMPHIS, TENN.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1884	St. Louis, Mo.	Wood.	$40,000.00	$24,231.36	Good.	Bank protection.	Improving Mississippi River, first and second districts.
		do.	25,900.00	21,387.22	Fair.	do.	Do.
		do.	23,510.00	29,214.42	Good.	do.	Do.
1884	Pittsburgh, Pa.	do.	9,500.00	12,543.83	Fair.	do.	Do.
		Iron.	9,500.00	5,022.79	Good.	Harbor boat.	Do.
		Wood.	5,330.00	6,670.16	do.	Surveys.	Do.
		do.	9,475.00	7,562.83	do.	Memphis, Tenn.	Do.
		do.	3,286.00	1,061.62	Fair.	Dredging Wolf River.	Do.
		do.	3,286.00	1,061.62	do.	do.	Do.

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[3] Formerly the W. M. Reese.

TABLE VI.—*Statement of floating plant owned by the United States and*

MEMPHIS, TENN.—Continued.

Name or number.	Class and description.	Dis-placement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 5	Barge, mattress (500 tons).		145	0	32	0	6	0	1893	Elizabeth, Pa.
No. 6	do		145	0	32	0	6	0	1893	do
No. 9308	Barge, mattress (300 tons).		120	0	30	0	5	0	1893	Levanna, Ohio
No. 9312	do		120	0	30	0	5	0	1893	do
No. 0701	Barge, mattress (380 tons).		144	0	32	0	5	0	1907	Memphis, Tenn
No. 0703	do		144	0	32	0	5	0	1907	do
No. 8	Quarter boat	125.00	135	0	25	0	8	0	1882	do
No. 11	do	125.00	135	0	25	0	8	0	1882	do
No. 12	do	125.00	135	0	25	0	8	0	1882	do
No. 25	do	125.00	135	0	25	0	8	0	1882	do
No. 26	do	125.00	135	0	25	0	8	0	1882	do
No. 27	do	43.00	90	6	18	6	3	0	1882	Ohio River
No. 29, Amelia	do	43.00	90	6	18	6	3	0	1882	do
No. 206	do	130.00	120	0	30	0	6	0	1894	Memphis, Tenn
No. 221	do	130.00	120	0	30	0	6	0	1894	do
No. 0601	do	30.00	68	0	18	0	4	0	1906	do
Machine shop No. 1	Machine shop	165.00	132	0	32	0	8	0	1882	New Albany, Ind
Wolf	Dipper dredge	156.00	80	0	28	0	4	6	1897	Madison, Ind
Grader No. 2	Hydraulic grader	300.00	110	0	30	0	5	0	1882	New Albany, Ind
Grader No. 9313	do	246.00	120	0	30	0	4	0	1903	Memphis, Tenn
Derrick boat No. 3	Steam power	177.00	75	0	30	0	5	0	1905	do
Pile driver No. 6	do	57.00	70	0	20	0	3	0	(1)	
Pile driver No. 9	do	57.00	70	0	20	0	3	0	(1)	
No. 1018	Barge, mattress (300 tons)		140	0	30	0	4	0	1910	Memphis, Tenn
No. 1019	do		140	0	30	0	4	0	1910	do
No. 9406	do		136	6	29	0	5	0	1894	Jeffersonville, Ind
No. 9407	do		136	6	29	0	5	0	1894	do
No. 1	Barge, mooring (280 tons)		120	0	25	0	5	0	1890	Memphis, Tenn
No. 2	do		120	0	25	0	5	0	1890	do
No. 9406	Barge, mooring (300 tons)		136	6	29	0	5	0	1894	Jeffersonville, Ind
No. 9409	do		136	6	29	0	5	0	1894	do
Flat No. 1	Boat, flat (38 tons)		45	0	15	0	3	0	1893	Elizabeth, Pa
Flat No. 2	Boat, flat (40 tons)		50	0	15	0	3	0	1893	Memphis, Tenn
Flat No. 3	do		50	0	15	0	3	0	1904	do
Flat No. 4	Boat, flat (35 tons)		40	0	15	0	3	0	1906	do
No. 9301	Barge, decked (400 tons)		120	0	30	0	6	0	1893	Elizabeth, Pa
No. 9303	do		120	0	30	0	6	0	1893	do
No. 9304	do		120	0	30	0	6	0	1893	do
No. 9305	do		120	0	30	0	6	0	1893	do
No. 9306	do		120	0	30	0	6	0	1893	do
No. 9309	do		120	0	30	0	6	0	1893	do
No. 9310	do		120	0	30	0	6	0	1893	Madison, Ind
No. 9315	do		120	0	30	0	6	0	1893	do
No. 9317	Barge, fuel (400 tons)		120	0	30	0	6	0	1893	do
No. 9318	Barge, decked (400 tons)		120	0	30	0	6	0	1893	do
No. 9319	do		120	0	30	0	6	0	1893	do
No. 9323	do		120	0	30	0	6	0	1893	do
No. 9324	do		120	0	30	0	6	0	1893	do
No. 9325	do		120	0	30	0	6	0	1893	do
No. 9326	do		120	0	30	0	6	0	1893	Levanna, Ohio
No. 9327	do		120	0	30	0	6	0	1893	do
No. 9328	do		120	0	30	0	6	0	1893	do
No. 0502	do		120	0	30	0	6	0	1905	Memphis, Tenn
No. 0801	Barge, decked (500 tons)		120	0	30	0	7	0	1908	Gulfport, Miss
No. 0802	do		120	0	30	0	7	0	1908	do
No. 0803	do		120	0	30	0	7	0	1908	do
No. 0804	do		120	0	30	0	7	0	1908	do
No. 0805	do		120	0	30	0	7	0	1908	Memphis, Tenn
No. 0806	Barge, cableway (500 tons).		120	0	30	0	7	0	1908	do
No. 0807	Barge, decked (500 tons)		120	0	30	0	7	0	1908	do
No. 0808	do		120	0	30	0	7	0	1908	do
No. 0809	do		120	0	30	0	7	0	1908	do

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[1] Transferred from St. Louis engineer office.

employed in the Engineer Department at Large on June 30, 1911—Continued.

MEMPHIS, TENN.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$4,530.00	$721.59	Poor	Bank protection	Improving Mississippi River, first and second districts.
		do	4,530.00	721.59	do	do	Do.
		do	5,120.00	3,113.48	Good	do	Do.
		do	5,120.00	3,113.48	do	do	Do.
		do	2,800.00	3,656.47	do	do	Do.
		do	2,800.00	3,656.47	do	do	Do.
		do	3,645.00	1,959.15	Fair	Store boat	Do.
		do	3,645.00	1,959.15	do	Bank protection	Do.
		do	3,645.00	1,959.15	Good	do	Do.
		do	3,645.00	4,399.92	do	do	Do.
		do	3,645.00	4,399.92	do	Carpenter shop	Do.
		do	2,788.00	3,222.16	Poor	Bank protection	Do.
		do	2,741.00	2,279.58	Fair	do	Do.
		do	4,900.00	4,158.49	Good	do	Do.
		do	4,900.00	4,158.49	do	do	Do.
		do	3,059.00	2,630.44	do	Surveys	Do.
		do	8,501.00	4,572.96	Fair	Machine shop	Do.
1898	Memphis, Tenn.	do	8,000.00	4,742.79	do	Dredging Wolf River.	Do.
		do	30,232.00	5,503.26	Good	Bank protection	Do.
		do	3,823.00	4,793.32	Fair	do	Do.
		do	2,956.00	3,192.64	do	do	Do.
		do	2,217.50	3,510.18	do	do	Do.
		do	2,217.50	3,510.18	do	do	Do.
		do	4,642.91	4,642.91	Good	do	Do.
		do	4,642.91	4,642.91	do	do	Do.
		do	3,750.00	93.50	Poor	do	Do.
		do	3,750.00	93.50	do	do	Do.
		do	2,023.00	2,908.02	Good	do	Do.
		do	2,023.00	2,908.02	do	do	Do.
		do	3,750.00	2,368.28	do	do	Do.
		do	3,750.00	2,368.28	do	do	Do.
		do	460.00	150.37	Poor	do	Do.
		do	410.00	329.39	Good	do	Do.
		do	496.00	100.29	Poor	do	Do.
		do	460.50	252.64	Fair	do	Do.
		do	3,100.00	1,103.58	Poor	do	Do.
		do	3,100.00	1,237.28	Fair	do	Do.
		do	3,100.00	1,237.28	do	do	Do.
		do	3,100.00	1,237.28	do	do	Do.
		do	3,100.00	1,586.34	Good	do	Do.
		do	3,100.00	1,103.58	Poor	do	Do.
		do	3,170.00	336.93	do	do	Do.
		do	3,170.00	873.40	do	do	Do.
		do	3,170.00	336.93	do	do	Do.
		do	3,170.00	873.40	Fair	do	Do.
		do	3,170.00	873.40	do	do	Do.
		do	3,170.00	873.40	Poor	do	Do.
		do	3,170.00	873.40	do	do	Do.
		do	3,170.00	873.40	Fair	do	Do.
		do	2,800.00	1,269.56	do	do	Do.
		do	2,800.00	1,269.56	Good	do	Do.
		do	2,800.00	1,269.56	Poor	do	Do.
		do	3,370.00	1,500.00	Fair	do	Do.
		Creosoted wood.	5,727.53	4,274.38	Good	do	Do.
		do	5,727.53	4,274.38	do	do	Do.
		do	5,727.53	4,274.38	do	do	Do.
		do	5,727.53	4,274.38	do	do	Do.
		Wood	3,531.50	2,037.88	do	do	Do.
		do	3,531.50	2,037.88	do	do	Do.
		Creosoted wood.	5,624.70	4,185.55	do	do	Do.
		do	5,624.70	4,185.55	do	do	Do.
		do	5,624.70	4,185.55	do	do	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

MEMPHIS, TENN.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	Ft.	in.	Ft.	in.	Ft.	in.		
No. 0810	Barge decked (500 tons)		120	0	30	0	7	0	1908	Memphis, Tenn
No. 0811	do		120	0	30	0	7	0	1908	Gulfport, Miss
No. 0901	do		120	0	30	0	7	0	1909	do
No. 0903	do		120	0	30	0	7	0	1909	do
No. 1001	do		120	0	30	0	7	0	1910	Memphis, Tenn
No. 1002	do		120	0	30	0	7	0	1910	do
No. 1003	do		120	0	30	0	7	0	1910	do
No. 1004	do		120	0	30	0	7	0	1910	do
No. 1007	do		120	0	30	0	7	0	1910	New Orleans, La
No. 1008	do		120	0	30	0	7	0	1910	do
No. 1009	do		120	0	30	0	7	0	1910	do
No. 1010	do		120	0	30	0	7	0	1910	do
No. 1011	do		120	0	30	0	7	0	1910	do
No. 1012	do		120	0	30	0	7	0	1910	do

MILWAUKEE, WIS.

Name or number.	Class and description.	Displacement.	Length ft.	Length in.	Beam ft.	Beam in.	Depth ft.	Depth in.	When.	Where.
Algoma [1]	Steam dipper dredge	258.00	78	6	30	4	7	2	1872	Chicago, Ill
Appleton [2]	do	214.00	90	0	32	0	7	0	1872	Dubuque, Iowa
Omro [3]	Steam grapple dredge	150.00	100	0	30	0	6	0	1878	Portage, Wis
Oshkosh [4]	Steam elevator dredge	234.00	75	0	31	0	6	0	1905	Green Bay, Wis
Industry	Steam tug (screw)	110.00	71	8	16	0	8	6	1890	Manitowoc, Wis
Manitowoc	Tow and survey steamer (screw).	184.00	100	0	20	0	10	6	1909	do
Fox	Steam tug (side-wheel)	128.00	102	0	18	4	5	0	1900	Oshkosh, Wis
Wolf	do	114.00	83	0	19	0	4	6	1900	do
Ariadne	Steam launch	17.00	45	6	9	0	4	8	1899	Manitowoc, Wis
Heron [6]	Gasoline launch (16 horsepower).	11.00	36	0	9	6	4	0	1908	Two Rivers, Wis
Inspector [7]	Gasoline launch (27 horsepower).	26.00	50	0	8	9	4	8	1903	Racine, Wis
Kingfisher [8]	Gasoline launch (45 horsepower).	19.00	41	1	10	0	4	4	1908	Two Rivers, Wis
Mallard [9]	Gasoline launch (16 horsepower).	9.00	35	0	9	0	3	9	1907	do
Pile driver scow No. 1.	Pile driver (floating)	[11] 42.00	66	4	21	4	6	6	1894	Sheboygan, Wis
Pile driver scow No. 2.	do	[13] 82.00	60	0	25	4	6	6	1906	Sturgeon Bay, Wis
Derrick scow No. 1	Derrick (floating)	73.00	66	6	29	6	5	10	1903	Milwaukee, Wis
Derrick scow No. 2	do	[14] 111.00	84	2	27	4	6	8	1908	Sturgeon Bay, Wis
Derrick scow No. 3	do	44.00	80	0	20	0	4	9	1901	Oshkosh, Wis
Derrick scow No. 4	do	44.00	80	0	20	0	4	9	1901	do
No. 1	Quarter boat (accommodations for 50 persons).	37.00	90	0	20	0	4	0	1875	Dubuque, Iowa
No. 2	Quarter boat (accommodations for 18 persons).	25.00	70	0	18	3	3	6	1911	Kaukauna, Wis
Delivery scow	Steel superstructure flat scow with conveyer for dredge Oshkosh.	42.00	31	4	([16])		([17])		1905	Green Bay, Wis
Intermediate No. 1	Wood superstructure flat scow with conveyer for dredge Oshkosh.	42.00	40	0	16	0	3	0	1905	do
Intermediate No. 2	do	42.00	40	0	16	0	3	0	1905	do
No. 1	60-ton flat scow	33.00	60	0	20	0	4	4	1897	Kewaunee, Wis
No. 2	150-ton flat scow	78.00	78	0	22	0	8	0	1896	Sheboygan, Wis
No. 4	do	78.00	78	0	22	0	8	0	1898	Kewaunee, Wis

[1] Name changed from dredge boat No. 1 to Algoma.
[2] Name changed from dredge boat No. 4 to Appleton.
[3] Name changed from dredge boat No. 5 to Omro.
[4] Name changed from conveyor dredge to Oshkosh.
[5] Repaired and lengthened 1911.
[6] Name changed from gasoline launch No. 3 to Heron.
[7] Changed from steam to gasoline in 1910.
[8] Name changed from gasoline launch No. 2 to Kingfisher.
[9] Name changed from gasoline launch No. 1 to Mallard.

employed in the Engineer Department at Large on June 30, 1911—Continued.

MEMPHIS, TENN.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Creosoted wood.	$5,624.70	$4,186.55	Good .	Bank protection.	Improving Mississippi River, first and second districts.
......	....	...do...	5,727.53	4,274.38	...do...	.....do..........	Do.
......	....	...do...	5,569.58	4,645.54	...do...	.....do..........	Do.
......	....	...do...	5,569.58	4,645.54	...do...	.....do..........	Do.
......	....	...do...	4,242.00	4,242.00	...do...	.....do..........	Do.
......	....	...do...	4,242.00	4,242.00	...do...	.....do..........	Do.
......	....	...do...	4,242.00	4,242.00	...do...	.....do..........	Do.
......	....	...do...	4,242.00	4,242.00	...do...	.....do..........	Do.
......	....	...do...	4,246.58	4,246.58	...do...	.....do..........	Do.
......	....	...do...	4,246.58	4,246.58	...do...	.....do..........	Do.
......	....	...do...	4,246.58	4,246.58	...do...	.....do..........	Do.
......	....	...do...	4,246.58	4,246.58	...do...	.....do..........	Do.
......	....	...do...	4,246.58	4,246.58	...do...	.....do..........	Do.
......	....	...do...	4,246.58	4,246.58	...do...	.....do..........	Do.

MILWAUKEE, WIS.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Wood.	$29,500.00	$10,000.00	Fair...	Green Bay, Wis..	Milwaukee, Wis., district.
1876	Berlin, Wis......	...do...	13,000.00	8,960.00	Good .	Fox River, Wis..	Do.
......	....	...do...	5,500.00	4,715.00	...do...	.....do..........	Do.
......	....	...do...	27,500.00	21,279.00	...do...	.....do..........	Do.
1899	Menominee, Mich	...do...	5,000.00	3,000.00	Fair...	Green Bay, Wis..	Do.
1909	Manitowoc, Wis.	Steel..	30,000.00	37,000.00	Good .	Harbors on west shore of Lake Michigan.	Do.
......	....	Wood.	7,135.00	4,472.00	...do...	Fox River, Wis..	Do.
......	....	...do...	7,675.00	4,570.00	...do...	.....do..........	Do.
1899	Manitowoc, Wis.	...do...	2,400.00	[5] 2,100.00	...do...	Sturgeon Bay Canal, Wis.	Do.
1908	Two Rivers, Wis	...do...	1,540.00	1,400.00	...do...	Milwaukee, Wis..	Do.
......	....	Steel..	5,000.00	1,710.00	...do...	Fox River, Wis ..	Do.
1908	Two Rivers, Wis	Wood.	1,960.00	2,500.00	...do...	Kewaunee, Wis..	Do.
1907	.....do..........	...do...	1,090.00	[10] 750.00	...do...	.....do..........	Do.
1896	Sheboygan, Wis .	...do...	3,450.00	[12] 2,800.00	...do...	.....do..........	Do.
1906	Waukegan, Ill...	...do...	4,840.00	4,000.00	...do...	.....do..........	Do.
1905	Milwaukee, Wis .	...do...	2,000.00	1,600.00	Fair...	.....do..........	Do.
1908	Sturgeon Bay, Wis.	...do...	5,625.00	5,100.00	Good .	.....do..........	Do.
......	....	...do...	2,000.00	[15] 2,000.00	...do...	Fox River, Wis..	Do.
......	....	...do...	2,000.00	[15] 2,000.00	...do...	.....do..........	Do.
......	....	...do...	2,000.00	217.00	Unserviceable.	.....do..........	Do.
......	....	...do...	1,675.00	1,675.00	Good..	.....do..........	Do.
......	....	...do...	5,000.00	3,870.00	...do...	.....do..........	Do.
......	....	...do...	3,250.00	2,515.00	...do...	.....do..........	Do.
......	....	...do...	3,250.00	2,382.00	...do...	.....do..........	Do.
1899	Kewaunee, Wis.	...do...	350.00	[10] 150.00	Fair...	Racine, Wis......	Do.
......	....	...do...	3,300.00	[10] 1,600.00	Good..	Green Bay, Wis..	Do.
......	....	...do...	3,948.00	1,000.00	Poor..	Kewaunee, Wis..	Do.

[10] Repaired 1910 and 1911.
[11] Without pile driver.
[12] Extensively repaired 1910 and 1911.
[13] With pile driver.
[14] Concrete mixer on scow.
[15] Rebuilt 1910 and 1911.
[16] Width: Forward, 16 feet 4 inches; aft, 33 feet 4 inches.
[17] Depth: Forward, 2 feet; aft, 4 feet.

TABLE VI.—*Statement of floating plant owned by the United States and*

MILWAUKEE, WIS.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Eureka No. 1	65-ton flat scow	27.00	70 0	18 0	4 0	1898	Oshkosh, Wis.
Eureka No. 2	do	27.00	70 0	18 0	4 0	1910	Kaukauna, Wis.
No. 5	25-ton flat scow	12.00	50 0	16 0	3 0	1904	Oshkosh, Wis.
No. 6	do	14.00	50 0	16 0	3 0	1903	do.
No. 1	3-ton flat work scow	2.60	30 0	10 0	2 8	1909	Kaukauna, Wis.
No. 2	do	2.60	30 0	10 0	2 8	1910	do.
No. 1	65-cubic yard side-dump scow.	35.00	70 6	18 0	5 2	1907	Oshkosh, Wis.
No. 2	do	35.00	70 6	18 0	5 2	1907	do.
No. 5	141-cubic yard center-dump scow.	112.00	78 0	22 0	8 0	1900	Kewaunee, Wis.
No. 6	do	112.00	78 0	22 0	8 0	1900	do.
No. 1	1-ton open scow	.50	18 0	5 0	1 10	1899	Kaukauna, Wis.
No. 4	do	.54	18 0	5 6	1 8	1897	Oshkosh, Wis.
No. 5	do	.28	14 0	4 0	1 8	1906	Kaukauna, Wis.
No. 6	do	.23	14 0	4 0	1 8	1910	do.
No. 7	do	.23	14 0	4 0	1 8	1911	do.
No. 1	20-ton pontoon scow	14.00	40 0	14 4	3 4	1896	Oshkosh, Wis.
No. 2	do	14.00	40 0	14 5	3 2	1908	Kaukauna, Wis.
No. 3	do	14.00	40 0	14 5	3 2	1908	do.
No. 4	do	14.00	40 0	14 5	3 2	1910	do.
Berlin	80-ton barge	26.00	81 2	18 6	4 2	1906	Oshkosh, Wis.
Montello	do	24.00	80 0	18 0	4 0	1905	Green Bay, Wis.
Princeton	60-ton barge	41.00	90 0	22 0	6 0	1890	Oshkosh, Wis.

MOBILE, ALA.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Barnard	Self-propelling hydraulic dredge.	1,291.00	198 0	38 0	14 0	1904	Camden, N. J.
Pascagoula	Hydraulic pipe-line dredge.	771.00	150 0	40 0	10 6	1909	Baltimore, Md.
Wahalak	do	808.00	150 0	40 0	11 6	1910	do.
Humphreys	do	234.00	100 0	32 0	8 9	1908	Mobile, Ala.
Chickasaw	Steam dispatch boat	155.00	99 6	18 4	9 9	1908	Pensacola, Fla.
Horace Harding	Steam tugboat	215.00	79 8	22 0	10 6	1909	Pascagoula, Miss.
Tuscaloosa	do	212.00	82 0	22 0	8 3	1908	do.
Biloxi	Naphtha launch	25.00	37 0	13 0	4 2	1909	Gulfport, Miss.
Jordan	do	8.50	28 10	9 10	3 0	1905	Pascagoula, Miss.
Wolf	do	18.00	31 0	9 6	2 8	1907	Mobile, Ala.
Mamie K.	do	2.00	25 0	6 0	2 7	1892	New York, N. Y.
Leaf	do	4.50	32 0	7 6	4 0	1907	Morris Heights, N.Y.
Nugent	Stern-wheel towboat	191.00	120 0	24 0	3 6	1904	Jeffersonville, Ind.
Sylph	Gasoline towboat	38.00	72 0	16 0	2 9	1900	Demopolis, Ala.
R. C. McCalla	Stern-wheel snag boat	133.00	100 0	28 0	5 0	1909	Jeffersonville, Ind.
Tombigbee	do	151.00	100 0	28 0	5 4	1909	do.
Black Warrior	do	305.00	136 6	33 2	4 4	1891	Mobile, Ala.
Pearl	do	128.00	82 0	26 0	6 0	1903	do.
Vienna[1]	do	152.00	100 0	26 0	4 6	1911	Pascagoula, Miss.

[1] Old snag boat Vienna condemned and sold; new snag boat built and named the Vienna.

employed in the Engineer Department at Large on June 30, 1911—Continued.

MILWAUKEE, WIS.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$956.00	$188.00	Unserviceable.	Fox River, Wis.	Milwaukee, Wis., district.
		...do...	1,555.00	1,475.00	Good.	...do...	Do.
		...do...	890.00	383.00	Fair.	...do...	Do.
		...do...	890.00	383.00	Good.	...do...	Do.
		...do...	86.71	82.00	...do...	...do...	Do.
		...do...	153.98	153.98	...do...	...do...	Do.
		...do...	2,950.00	2,462.00	...do...	...do...	Do.
		...do...	2,950.00	2,462.00	...do...	...do...	Do.
		...do...	4,260.00	2,000.00	Fair.	Green Bay, Wis.	Do.
		...do...	4,260.00	2,000.00	...do...	...do...	Do.
		...do...	50.00	14.00	...do...	Fox River, Wis.	Do.
		...do...	23.00	6.00	Unserviceable.	...do...	Do.
						...do...	Do.
		...do...	27.42	21.00	Poor.	...do...	Do.
		...do...	19.50	19.50	Good.	...do...	Do.
		...do...	14.04	14.04	...do...	...do...	Do.
		...do...	560.00	58.00	Unserviceable.	...do...	Do.
		...do...	876.71	751.00	Fair.	...do...	Do.
		...do...	876.71	751.00	...do...	...do...	Do.
		...do...	720.70	720.00	Good.	...do...	Do.
		...do...	2,075.00	1,606.00	...do...	...do...	Do.
		...do...	2,014.00	1,727.00	...do...	...do...	Do.
		...do...	2,000.00	258.00	Poor.	...do...	Do.

MOBILE, ALA.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
		Steel.	$230,000.00	$135,000.00	Good.	Habana, Cuba.	Gulfport Harbor, Miss.
		...do...	143,500.00	130,000.00	...do...	Gulfport, Miss.	Harbors on coast of Mississippi.
1910	Baltimore, Md.	...do...	159,500.00	159,000.00	...do...	Mobile, Ala.	Harbor at Mobile, Ala.
		Wood.	46,600.00	38,000.00	...do...	Black Warrior River.	Black Warrior and Tombigbee Rivers.
		Steel.	27,500.00	20,000.00	...do...	Mobile, Ala.	Harbor at Mobile, Ala.
1910	Mobile, Ala.	Wood.	22,500.00	20,000.00	...do...	...do...	Do.
1908	...do...	...do...	21,500.00	20,000.00	...do...	Gulfport, Miss.	Harbors on coast of Mississippi.
		...do...	3,215.00	2,700.00	...do...	Mobile, Ala.	Do.
1910	Pascagoula, Miss.	...do...	600.00	500.00	Fair.	Pascagoula, Miss.	Pascagoula River, Miss.
1907	Mobile, Ala.	...do...	900.00	600.00	...do...	Gulfport, Miss.	Defenses of Mobile, Ala.
1898	...do...	...do...	1,000.00	200.00	Bad.	Black Warrior River.	Black Warrior and Tombigbee Rivers.
1907	Morris Heights, N. Y.	...do...	2,350.00	1,700.00	Fair.	Fort Morgan, Ala.	Mobile Harbor, Pascagoula River, and Horn Island Pass, Miss.
1905	Louisville, Ky.	...do...	19,000.00	13,500.00	Good.	Black Warrior River.	Black Warrior and Tombigbee Rivers.
1906	Demopolis, Ala.	...do...	2,500.00	2,800.00	...do...	...do...	Do.
		...do...	19,000.00	13,000.00	...do...	...do...	Do.
		...do...	19,000.00	16,500.00	...do...	Tombigbee River, Ala.	Tombigbee River, Ala.
		...do...	28,000.00	4,500.00	Poor.	Pearl River, Miss.	Do.
		...do...	3,250.00	7,500.00	Fair.	...do...	Pearl River, Miss.
		...do...	11,342.00	11,342.00	Good.	Tombigbee River, Ala.	Tombigbee River, Ala. and Miss.

TABLE VI.—*Statement of floating plant owned by the United States and*

MOBILE, ALA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Demopolis	Nonpropelling steam capstan snag boat.	96.00	82	3	25	6	4	9	1891	Mobile, Ala
Escatawpa	do	62.00	60	0	20	0	4	0	1910	Hattiesburg, Miss
Quarter boat A	Quarter boat	34.00	45	0	24	0	5	0	1904	Tuscaloosa, Ala
Quarter boat B	do	33.00	60	0	20	0	3	4	1904	do
Derrick boat C	Derrick boat	29.00	42	6	32	0	3	6	1900	do
No. 1	200-ton barge	51.00	90	0	24	0	5	0	1902	do
No. 2	165-ton barge	50.00	90	0	24	0	5	3	1902	do
No. 3	200-ton barge	51.00	90	0	24	0	5	0	1902	do
No. 4	do	51.00	90	0	24	0	5	0	1902	do
No. 5	do	51.00	90	0	24	0	5	0	1902	do
No. 6	Dredge boat	91.00	90	0	24	0	5	0	1903	do
No. 8	160-ton barge	44.00	70	0	25	0	5	9	1904	Mobile, Ala
No. 9	175-ton barge	54.00	78	0	25	2	7	0	1904	do
No. 10	160-ton barge	44.00	70	0	25	0	5	9	1904	Mobile, Ala
No. 11	115-ton barge	22.00	60	5	22	0	5	3	1904	Pascagoula, Miss
No. 12	200-ton barge	51.00	90	0	24	0	5	0	1905	Tuscaloosa, Ala
No. 13	do	51.00	90	0	24	0	5	0	1905	do
No. 14	do	51.00	90	0	24	0	5	0	1906	do
No. 15	165-ton barge	50.00	90	0	24	0	5	3	1906	do
No. 16	197-ton barge	96.00	80	6	27	6	7	0	1905	Mobile, Ala
No. 17	150-ton barge	44.00	70	6	24	0	6	3	1905	Pascagoula, Miss
No. 18	do	45.00	70	8	24	1	6	3	1906	do
No. 19	Clam-shell derrick boat	99.00	75	9	25	1	6	8	1906	do
No. 20	200-ton barge	51.00	90	0	24	0	5	0	1907	Tuscaloosa, Ala
No. 21	do	51.00	90	0	24	0	5	0	1907	do
No. 22	do	51.00	90	0	24	0	5	0	1907	do
No. 23	do	51.00	90	0	24	0	5	0	1908	do
A	65-ton barge	17.00	54	0	18	0	3	0	1902	Mobile, Ala
B	do	17.00	54	0	18	0	3	0	1902	do
C	do	17.00	54	0	18	0	3	0	1909	Pascagoula, Miss
D	30-ton barge	15.00	54	1	18	1	3	3	1909	do
E	340-ton barge	104.00	91	0	27	2	8	0	1909	do
F	42-ton barge	12.00	45	0	15	0	4	0	1901	do
G	340-ton barge	104.00	91	0	27	2	8	0	1910	Gulfport, Miss
H	64-ton barge	23.00	54	0	18	0	4	0	1910	do
I[1]	28-ton barge	11.00	36	0	18	0	2	4	1910	Hattiesburg, Miss
J	63-ton barge	17.00	54	0	18	0	3	0	1911	Pascagoula, Miss

Barges reported as Nos. 7 and 8 last year, condemned and sold, and another barge given the number 8.

MONTGOMERY, ALA.

Caucus	Seagoing hopper dredge	1,400.00	185	0	41	0	23	2	1905	Greenport, L. I
Pettus[2]	Stern-wheel hydraulic dredge.	488.00	135	0	35	0	6	6	1908	Gulfport, Miss Montgomery, Ala

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[1] Formerly quarter boat Hattiesburg; house removed and converted into barge I as planned when the same was constructed.

employed in the Engineer Department at Large on June 30, 1911—Continued.

MOBILE, ALA—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$4,067.00	$2,400.00	Good.	Tombigbee River, Ala.	Tombigbee River, Ala. and Miss.
......	....	...do...	3,246.00	3,200.00	...do...	Leaf River, Miss.	Leaf River, Miss.
......	....	...do...	2,000.00	900.00	Fair...	Black Warrior River.	Black Warrior and Tombigbee Rivers.
......	....	...do...	2,000.00	900.00	...do...	.....do...........	Do.
......	....	...do...	1,700.00	200.00	Bad...	.....do...........	Do.
......	....	...do...	1,900.00	500.00	...do...	.....do...........	Do.
......	....	...do...	2,500.00	300.00	...do...	Tombigbee River, Ala.	Do.
......	....	...do...	1,900.00	800.00	Fair...	Black Warrior River.	Do.
......	....	...do...	1,900.00	500.00	Bad...	.....do...........	Do.
......	....	...do...	1,900.00	800.00	Fair...	.....do...........	Do.
......	....	Wood and steel.	3,600.00	3,600.00	Good..	.....do...........	Do.
1905	Mobile, Ala.....	Wood.	1,500.00	1,200.00	...do...	.....do...........	Do.
1905	.....do...........	...do...	1,800.00	300.00	Bad...	Tombigbee River, Ala.	Do.
1905	Mobile, Ala.....	...do...	1,500.00	1,400.00	Good..	Black Warrior River.	Do.
1905	.....do...........	...do...	1,495.00	500.00	Bad...	.....do...........	Do.
......	....	...do...	2,500.00	1,200.00	Fair...	.....do...........	Do.
......	....	...do...	2,300.00	800.00	Bad...	.....do...........	Do.
......	....	...do...	2,300.00	1,000.00	Fair...	.....do...........	Do.
......	....	...do...	2,300.00	1,200.00	...do...	Tombigbee River, Ala.	Do.
1905	Mobile, Ala.....	...do...	2,400.00	1,200.00	...do...	.....do...........	Do.
1905	Moss Point, Miss.	...do...	1,630.00	1,300.00	Good..	.....do...........	Do.
1906	.....do...........	...do...	2,000.00	1,200.00	...do...	.....do...........	Do.
1907	Mobile, Ala.....	...do...	2,050.00	4,000.00	...do...	.....do...........	Do.
......	....	...do...	2,200.00	1,200.00	Fair...	Black Warrior River.	Do.
......	....	...do...	2,000.00	1,200.00	...do...	.....do...........	Do.
......	....	...do...	2,200.00	1,200.00	...do...	.....do...........	Do.
......	....	...do...	2,200.00	1,400.00	Good..	.....do...........	Do.
......	....	...do...	590.00	200.00	Bad...	Mobile, Ala......	Tombigbee River, Ala. and Miss.
......	....	...do...	590.00	200.00	...do...	Pearl River, Miss.	Do.
......	....	...do...	600.00	500.00	Fair...	.....do...........	Pearl River, Miss.
......	....	...do...	600.00	500.00	Good..	Tombigbee River, Ala.	Tombigbee River, Ala., and Pearl River, Miss.
......	....	...do...	3,649.00	3,200.00	...do...	Mobile, Ala......	Harbors on coast of Mississippi.
1909	Pascagoula, Miss.	...do...	350.00	250.00	...do...	.....do...........	Do.
......	....	...do...	4,100.00	4,000.00	...do...	Gulfport, Miss....	Harbor at Mobile, Ala.
......	....	...do...	1,421.00	1,300.00	...do...	.....do...........	Do.
......	....	...do...	951.00	300.00	...do...	Leaf River, Miss..	Leaf River, Miss.
......	....	...do...	880.00	880.00	...do...	Tombigbee River, Ala.	Tombigbee River, Ala. and Miss.

MONTGOMERY, ALA.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1906	Greenport, L. I..	Wood.	$150,000.00	$170,000.00	Good..	St. Andrews Bay, Fla.	Improving harbor, Pensacola, Fla.
......	....	Wood (creosoted)	62,352.25	60,000.00	..do...	Middle Gause bar, Alabama River, Ala.	Improving Alabama River, Ala.

[2] Hull built at Gulfport, Miss., cabin at Montgomery, Ala.

TABLE VI.—*Statement of floating plant owned by the United States and*

MONTGOMERY, ALA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Blackwater	Nonpropelling hydraulic dredge.	465.00	110	0	32	0	9	4	1911	Pine Barren, Fla.
Muscogee [1]	do	281.00	120	0	30	0	7	5	1904	Bainbridge, Ga.
Upatoi [2]	Dipper dredge	212.00	85	0	30	0	6	0	1901	Columbus, Ga.
Autauga [3]	do	206.00	75	0	26	4	5	6	1901	Mobile, Ala.
Attalla [4]	do	206.00	75	0	26	4	5	6	1902	Lock 4, Coosa River, Ala.
Albany [5]	Orange-peel dredge	75.00	70	0	30	0	4	9	1908	Columbus, Ga.
Wm. J. Twining	Stern-wheel steam snag boat.	370.00	155	0	33	0	4	0	1881	Mobile, Ala.
Chattahoochee	do	233.00	140	0	29	0	4	0	1896	Burdock's Landing, Ala.[6]
Flint	do	127.00	95	0	24	0	4	0	1893 1894	do
Choctawhatchee	do	115.00	90	0	24	0	3	6	1902 1903	Pine Barren, Fla.
Escambia [7]	do	112.00	92	0	25	0	4	0	1885	Montgomery, Ala.
Conecuh [8]	Nonpropelling snag boat.	37.00	60	0	20	0	3	0	1907	River Falls, Ala.
Alabama [9]	Stern-wheel steam towboat.	219.00	134	5	26	4	4	4	1895	Marietta, Ohio
Leota [10]	do	167.00	120	0	20	0	4	10	1888	Gadsden, Ala.
Columbus	Stern-wheel steam towboat.	227.50	134	0	28	0	4	0	1904	Bainbridge, Ga.
Coosa	Gasoline towboat	60.00	80	0	18	0	4	6	1910 1911	Near Lock 3, Ala.
Arrow	Gasoline launch	1.75	31	6	7	4	3	5	1910	Fort Pickens, Fla.
Eufaula	do	2.00	25	0	7	3	2	4	1905	St. Joseph, Mich.
Etowah [11]	do	.50	15	10	5	3	1	10	([12])	Unknown

[1] Formerly dredge No. 4.
[2] Rebuilt 1909–10, Columbus, Ga., formerly dredge No. 1.
[3] Formerly dredge No. 2.
[4] Formerly dredge No. 3.
[5] Formerly dredge No. 5.
[6] Near Fort Mitchell, Ala.

employed in the Engineer Department at Large on June 30, 1911—Continued.

MONTGOMERY, ALA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$63,289.23	$63,289.00	Good..	Narrows, Santa Rosa Sound, Fla.	Improving Narrows, Santa Rosa Sound, Fla.; improving Blackwater River, Fla.; and improving channel, Apalachicola River to St. Andrews Bay, Fla.
1904	Bainbridge, Ga..	...do...	12,900.00	12,000.00	..do...	Lake Wimico, Fla.	Improving Chattahoochee River, Ga. and Ala.
......	....	...do...	13,749.00	15,000.00	...do...	Snake Shoals, Chattahoochee River.	Do.
......	....	...do...	13,440.00	7,000.00	Fair...	Near Selma, Ala..	Improving Alabama River, Ala.
......	....	..do...	10,000.00	9,000.00	Good..	Mayo's bar, Ga...	Operating and care of canals, etc., Coosa River, Ga. and Ala.
......	....	...do...	11,730.84	10,000.00	...do...	Griffin's Pocket, Flint River, Ga.	Improving Flint River, Ga.
......	....	...do...	22,600.00	18,000.00	...do...	Near Montgomery, Ala.	Improving Alabama River, Ala.
......	....	...do...	12,600.00	15,000.00	...do...	Snake Shoals, Chattahoochee River.	Improving Chattahoochee River, Ga. and Ala.
......	....	...do...	4,500.00	7,000.00	..do...	Dead Lakes, Upper Chipola River, Fla.	Improving Flint River, Ga.
......	....	...do...	5,400.00	3,600.00	.do...	Holmes River, Fla.	Improving Choctawhatchee River, Fla. and Ala.
......	....	...do...	3,500.00	3,200.00	...do...	Escambia River, Fla.	Improving Escambia and Conecuh Rivers, Fla. and Ala.
......	....	...do...	1,250.00	1,250.00	Fair...	.....do...........	Do.
1896	Louisville, Ky..	...do...	15,600.00	12,000.00	Good..	Near Montgomery, Ala.	Improving Alabama River, Ala.
1892	Gadsden, Ala....	...do...	6,000.00	13,500.00	...do...	Lock 4, Coosa River, Ala.	Improving Coosa River, Ga. and Ala., between Rome, Ga., and Lock 4, Ala.
1904	Bainbridge, Ga..	...do...	20,700.00	19,000.00	..do...	Mary Freeman's bar, Chattahoochee River.	Improving Chattahoochee River, Ga. and Ala.
......	....	...do...	10,674.76	10.674.00	...do...	Mayo's bar, Coosa River.	Improving Coosa River, Ga. and Ala. (lock in Dam No. 4, and site for Dam No. 5).
......	....	...do...	1,960.00	1,960.00	..do...	Pensacola Harbor, Fla.	Improving harbor, Pensacola, Fla.
1905	St. Joseph, Mich.	...do...	950.00	650.00	...do...	Columbus, Ga....	Improving Chattahoochee River, Ga. and Ala.
1910	Columbus, Ga...	...do...	175.00	300.00	...do...	Mayo's bar, Coosa River.	Improving Coosa River, Ga. and Ala. (lock and dam at Mayo's bar, Ga.).

[7] Rebuilt, 1909, at Pine Barren, Fla.
[8] Formerly barge No. 22, fitted up as hand-power snag boat, 1910.
[9] Formerly John Mills.
[10] Rebuilt, 1908, at Lock 4, Ala.
[11] New engine installed 1910-11.
[12] Unknown.

TABLE VI.—*Statement of floating plant owned by the United States and*

MONTGOMERY, ALA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Oostenaula	Gasoline launch	1.20	25 0	5 6	2 5	1911	St. Joseph, Mich
Catoma	Kerosene launch	2.00	25 0	7 3	2 4	1907	do
Santa Rosa	Auxiliary schooner	64.00	70 0	16 0	8 0	1908	Pensacola Navy Yard, Fla.
1 barge	Hull of old steamboat		130 0	18 0	4 0	1891	Rome, Ga
No. 1	Pile-driver barge		81 0	22 0	4 0	1891	Cahaba, Ala
No. 2	do	14.00	40 0	18 0	3 0	1906	Mobile, Ala
No. 3	do	8.80	30 0	16 0	2 0	1906	Wetumpka, Ala
No. 4 [1]	do	17.50	40 0	18 0	3 0	1904	Burdock's Landing, Ala. [2]
No. 5 [1]	do	17.50	40 0	18 0	3 0	1904	do
No. 17 [3]	do	17.50	40 0	18 0	3 0	1904	do
No. 26	do	17.50	40 0	18 0	3 0	1910	Columbus, Ga
No. 16 [4]	Drilling barge	60.00	68 0	26 0	5 0	1903	Bainbridge, Ga
No. 6	100-ton barge	30.00	80 0	22 0	4 2	1906	Mobile, Ala
No. 7	do	30.00	80 0	22 0	4 2	1906	do
No. 8	do	30.00	80 0	22 0	4 2	1906	do
No. 9	do	30.00	80 0	22 0	4 2	1906	do
No. 18	10-ton barge		30 0	10 0	1 8	1903	Burdick's landing, Ala. [5]
No. 19 [5]	250-ton barge	82.00	125 0	28 0	5 2	1903	Bainbridge, Ga
No. 20	do		125 0	28 0	5 2	1903	do
No. 21 [6]	30-ton barge	17.50	40 0	18 0	3 0	1907	Columbus, Ga
No. 23	110-ton barge		80 0	29 0	5 0	1894	Pensacola, Fla
No. 24	do		72 0	27 0	5 0	1895	do
No. 34	50-ton barge	18.00	50 0	20 0	4 0	1911	Mayo's bar, near Rome, Ga.
No. 35	60-ton barge	29.00	65 0	24 0	4 0	1911	do
No. 10	100-ton barge (creosoted)	30.00	80 0	22 0	4 2	1907	Mobile, Ala
No. 11	do	30.00	80 0	22 0	4 2	1907	do
No. 12	do	30.00	80 0	22 0	4 2	1907	do
No. 13	do	30.00	80 0	22 0	4 2	1907	do

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[1] Rebuilt 1910, at Columbus, Ga.

[2] Near Fort Mitchell, Ala.

[3] Formerly rock barge (rebuilt and converted into pile-driver barge, 1910, at Columbus, Ga.).

employed in the Engineer Department at Large on June 30, 1911—Continued.

MONTGOMERY, ALA—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1911	St. Joseph, Mich.	Wood.	$886.00	$886.00	Good..	Lock 4, Coosa River.	Improving Coosa River, Ga. and Ala. (lock in Dam No. 4 and site for Dam No. 5).
1907	.....do..........	..do...	1,225.00	800.00	Fair...	Near Montgomery, Ala.	Improving Alabama River, Ala.
1906	Pensacola Navy Yard, Fla.	...do...	21,423.98	21,400.00	Good..	Various improvements.	Improving harbor, Pensacola, Fla.
1901	Gadsden, Ala...	...do...	350.00	....	Worthless.	Sunk at Lock 3, Ala.	Operating and care of canals, etc. (Coosa River, Ga. and Ala.).
......	....	...do...	2,500.00	....	...do...	Sunk near Montgomery, Ala.	Improving Alabama River, Ala.
1906	Mobile, Ala......	...do...	742.00	200.00	Poor..	Near Montgomery, Ala. (used as quarters).	Do.
......	....	...do...	300.00	80.00	...do...	.....do..........	Do.
......	....	..do...	375.00	750.00	Good..	Mary Freeman's bar, Chattahoochee River.	Improving Chattahoochee River, Ga. and Ala.
......	....	...do...	375.00	750.00	...do...	.....do..........	Do.
......	....	...do...	300.00	500.00	Fair...	.....do..........	Improving Flint River, Ga.
......	....	...do...	375.00	375.00	Good..	.....do..........	Improving Chattahoochee River, Ga. and Ala.
......	....	...do...	2,960.00	5,000.00	...do...	Griffin's pocket, Flint River, Ga.	Improving Flint River, Ga.
1906	Mobile, Ala......	...do...	1,703.00	450.00	Poor..	Near Montgomery, Ala.	Improving Alabama River, Ala.
1906	.....do..........	...do...	1,703.00	450.00	...do...	.....do..........	Do.
1906	.....do..........	...do...	1,703.00	450.00	...do...	.....do..........	Do.
1906	.....do..........	...do...	1,703.00	450.00	...do...	.....do..........	Do.
......	....	...do...	300.00	....	Worthless.	Beached at Tea-Cup Shoals, Flint River.	Improving Flint River, Ga.
......	....	...do...	4,000.00	4,000.00	Good..	Mary Freeman's bar, Chattahoochee River.	Improving Chattahoochee River, Ga. and Ala.
......	....	...do...	4,000.00	....	Worthless.	Sunk at Jernigan's landing, Chattahoochee River.	Do.
......	....	...do...	450.00	750.00	Good..	Mary Freeman's bar, Chattahoochee River.	Do.
1896	Pensacola, Fla..	...do...	1,350.00	....	Worthless.	Sunk at Burdock's landing, Chattahoochee River.	National defense (war) gun and mortar batteries.
1898	.....do..........	...do...	1,850.00	....	...do...	Sunk at Flournoy's landing, Chattahoochee River.	Do.
......	....	...do...	499.37	499.00	Good..	Mayo's bar, Coosa River.	Improving Coosa River, Ga. and Ala. (lock and dam at Mayo's bar, Ga.).
......	....	...do...	642.70	642.00	...do...	.....do..........	Do.
1907	Mobile, Ala......	...do...	2,975.00	2,000.00	...do...	Near Montgomery, Ala.	Improving Alabama River, Ala.
1907	.....do..........	...do...	2,975.00	2,000.00	...do...	.....do..........	Do.
1907	.....do..........	...do...	2,975.00	2,000.00	...do...	.....do..........	Do.
1907	.....do..........	...do...	2,975.00	2,000.00	...do...	.....do..........	Do.

[4] Rebuilt, 1910, at Columbus, Ga.
[5] Near Fort Mitchell, Ala.
[6] Rebuilt, 1908, at Apalachicola, Fla.

TABLE VI.—*Statement of floating plant owned by the United States and*

MONTGOMERY, ALA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
No. 14 [1]	100-ton barge (creosoted)	30.00	80 0	22 0	4 2	1907	Gulfport, Miss., Lock 3, Ala.
No. 15 [1]	do	30.00	80 0	22 0	4 2	1907	do
No. 27	300-ton barge (creosoted)	82.00	124 0	28 0	7 0	1910	New Orleans, La
No. 28	do	82.00	124 0	28 0	7 0	1910	do
No. 29	do	82.00	124 0	28 0	7 0	1910	do
No. 30	do	82.00	124 0	28 0	7 0	1910	do
No. 32	do	92.50	130 0	26 0	6 0	1911	Near Lock 3, Coosa River.
No. 33 [2]	do		130 0	26 0	6 0		Building near Lock 3, Ala.
No. 31	300-ton barge (carbolineum).	87.00	125 0	28 0	7 0	1910	Columbus, Ga
No. 1	Dump scow		73 0	20 0	6 1	1903	Bainbridge, Ga
No. 2	do		73 0	20 0	6 1	1903	do
No. 1	Quarter boat	23.00	50 0	20 0	3 7	1906	Mobile, Ala
No. 2	do	23.00	50 0	20 0	3 7	1906	do
No. 3	do	26.00	60 0	16 0	2 0	1907	River Falls, Ala
No. 4	do	48.00	70 0	21 6	3 0	1907	Columbus, Ga
No. 25 [3]	do	120.00	80 0	29 0	5 0	1894	Pensacola, Fla
Thronateeska [4]	do	96.80	75 0	26 0	4 7	1903	Bainbridge, Ga
Nos. 1 to 4	Pontoons	[5] 1.00	16 0	4 0	1 9	1908	Gulfport, Miss
Nos. 5 to 40	do	[5] 1.00	16 0	4 0	1 9	1909	Montgomery, Ala
Nos. 41 and 42	do	[5] 1.70	16 0	6 0	1 9	1910	Gardners Island, Alabama River.

NASHVILLE, TENN.

No. 1	Dipper dredge	200.40	80 0	30 0	7 0	1903	Jeffersonville, Ind
Cumberland	Stern-wheel towboat	171.00	130 0	24 0	4 0	1898	do
John	Stern-wheel steam tender.	34.00	86 0	18 0	2 6	1903	do
Henry	do	34.00	86 0	18 0	2 6	1903	do
Tom Ray	Stearn-wheel towboat	9.00	60 0	18 0	1 6	1908	Nashville, Tenn
No. 1	Gasoline tender	27.30	75 0	15 0	2 6	1910	Lock 7, Cumberland River.
No. 1	Snag boat	62.50	90 0	24 0	2 6	1909 1910	do
Apex	Snag boat hull	60.00	80 0	24 0	2 6	1896	Lock 4. Cumberland River.

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[1] Framed and creosoted at Gulfport, Miss., and completed at Lock 3, Ala.
[2] 60 per cent completed June 30, 1911.
[3] Formerly barge equipped with dredging outfit; dredging machinery removed and barge converted into quarter boat, 1910.

mployed in the Engineer Department at Large on June 30, 1911—Continued.

MONTGOMERY, ALA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1907	Gulfport, Miss...	Wood.	$4,007.50	$3,750.00	Good..	Mayo's bar, Coosa River.	Operating and care of canals, etc. (Coosa River, Ga. and Ala.).
1907	.....do..........	...do...	4,007.50	3,750.00	...do...	Lock No. 4, Coosa River.	Do.
1910	New Orleans, La.	...do...	4,151.60	4,000.00	...do...	Near Montgomery, Ala.	Improving Alabama River, Ala.
1910	.....do..........	...do...	4,151.60	4,000.00	...do...	.....do..........	Do.
1910	.....do..........	...do...	4,251.44	4,000.00	...do...	Burdock's landing, Chattahoochee River.	Improving Chattahoochee River, Ga. and Ala.
1910	.....do..........	...do...	4,251.44	4,000.00	...do...	.....do..........	Do.
......	....	...do...	6,377.88	6,377.00	...do...	Lock No. 4, Coosa River.	Improving Coosa River, Ga. and Ala. (lock in Dam No. 4 and site for Dam No. 5).
......	....	...do...	....	....	....	Building at Lock No. 3, Coosa River.	Do.
......	....	...do...	9,165.98	9,100.00	Good..	Lake Wimico, Fla.	Improving Chattahoochee River, Ga. and Ala.
1903	Bainbridge, Ga..	...do...	3,800.00	....	Worthless.	Sunk in Yellow River, Fla. (unserviceable).	Do.
1903	.....do..........	...do...	3,800.00	....	...do...	.....do..........	Do.
1906	Mobile, Ala......	...do...	1,590.00	400.00	Fair...	Near Montgomery, Ala.	Improving Alabama River, Ala.
1906	.....do..........	...do...	1,590.00	400.00	...do...	.....do..........	Do.
......	....	...do...	1,000.00	500.00	...do...	Escambia River, Fla.	Improving Escambia and Conecuh Rivers, Fla. and Ala.
......	....	...do...	2,500.00	2,000.00	Good..	Burdock's landing, Chattahoochee River.	Improving Chattahoochee River, Ga. and Ala.
1896	Pensacola Fla....	...do...	1,850.00	3,000.00	...do...	The Narrows, Santa Rosa Sound, Fla.	Gun and mortar batteries (Pensacola Harbor, Fla.)
1903	Bainbridge, Ga..	...do...	7,460.00	3,000.00	Fair...	Mary Freeman's bar, Chattahoochee River.	Improving Flint River, Ga.
1908	Gulfport, Miss...	...do...	[5] 55.00	[5] 50.00	...do...	Near Montgomery, Ala.	Improving Alabama River, Ala.
......	....	...do...	[5] 57.00	[5] 28.00	...do...	.....do..........	Do.
......	....	...do...	[5] 65.00	[5] 42.50	...do...	.....do..........	Do.

NASHVILLE, TENN.

1903	Jeffersonville, Ind.	Wood.	$18,650.00	$9,000.00	Fair...	Cumberland River.	Cumberland River.
1898	.....do..........	...do...	12,400.00	9,500.00	Good..	.....do..........	Do.
1903	.....do..........	...do...	4,535.00	3,000.00	...do...	.....do..........	Do.
1903	.....do..........	...do...	4,535.00	3,000.00	...do...	.....do..........	Do.
1909	Nashville, Tenn.	...do...	800.00	400.00	Fair...	.....do..........	Do.
......	....	...do...	3,918.51	3,900.00	Good..	.....do..........	Do.
......	....	...do...	3,018.27	2,900.00	...do...	.....do..........	Do.
......	....	...do...	1,100.00	([6])	Worthless.	.....do..........	Do.

[4] Formerly snag boat with steam capstan.

[5] Each.

[6] No money value.

TABLE VI.—*Statement of floating plant owned by the United States and*

NASHVILLE, TENN.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
No. 1	80-cubic-yard dump scow (side).		75 0	20 0	6 0	1903	Jeffersonville, Ind.
No. 2	do		75 0	20 0	6 0	1903	do.
No. 3	do		80 0	20 0	5 0	1909	Muscle Shoals Canal, Tennessee River.
No. 4	do		80 0	20 0	5 0	1909	do.
No. 1	Derrick boat	70.00	70 0	26 0	4 0	1903	Madison, Ind.
No. 2	do	70.00	70 0	26 0	4 0	1903	do.
No. 3	do	100.00	80 0	30 0	4 2	1909	Lock 3, Cumberland River.
A[2]	do	34.00	55 0	18 0	3 0	1898	Obion, Tenn.
No. 1	Barge, decked	100.00	90 0	18 0	4 0	1903	Madison, Ind.
No. 2	do	100.00	90 0	18 0	4 0	1903	do.
No. 3	do	100.00	90 0	18 0	4 0	1903	do.
No. 4	do	100.00	90 0	18 0	4 0	1903	do.
No. 5	do	100.00	90 0	18 0	4 0	1903	do.
No. 6	do	100.00	90 0	18 0	4 0	1903	do.
No. 7	do	210.00	110 0	22 0	5 0	1909	Lock 3, Cumberland River.
No. 8	do	210.00	110 0	22 0	5 0	1909	do.
No. 10	do	200.00	100 0	22 0	5 0	1909	Muscle Shoals Canal, Tennessee River.
No. 11	Barge, decked (covered).	200.00	100 0	22 0	5 0	1909	do.
No. 12	Barge, decked	200.00	100 0	22 0	5 0	1909	do.
Caney Fork[3]	Quarter boat		65 0	14 0	2 6	1907	Lock 2, Cumberland River.
P[2]	Barge		40 0	14 0	2 0	1908	Dover, Tenn.

NEW LONDON, CONN.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Castle	Steam tug	165.30	94 4	19 0	10 6	1897	Baltimore, Md.
Panuco	Steam lighter	(4)	107 0	28 0	8 6	1882	Boston, Mass.
Katharine	Motor boat	2.00	30 5	7 11	3 11	1909	South Norwalk, Conn.

NEW ORLEANS, LA.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Atlantic	Hydraulic dredge		288 0	47 6	25 0	1904	Sparrows Point, Md.
Benyaurd	do		271 6	47 6	23 0	1900 1904	Richmond, Va. Norfolk, Va.
Delatour	Hydraulic dredge Snag-boat.		112 0	30 0	5 0	1909	Jeffersonville, Ind.
Tonty[5]	Steam yacht	120.00	96 1	16 0	5 6	[6]1886	New York, N. Y. New Orleans, La.
General Reese	Steam launch	29.00	48 0	12 0	5 0	1876	do
C. Donovan	Steam tug	180.00	95 0	19 6	10 0	1895	Newport News, Va.
Uacha[7]	do	43.00	62 0	14 0	7 6	1878	Philadelphia, Pa.
Hyacinth	Steamboat	75.00	89 0	18 4	2 6	[8]1906	New Orleans, La.
Picket	Survey boat	32.00	52 0	12 3	6 3	1905	Madisonville, La.
Stadia	Naphtha launch	5.00	30 3	6 5	2 7	1894	New York, N. Y.

[1] No money value.

[2] Not previously given a letter.

[3] Not previously named.

[4] Light, 287.9 tons; loaded, 487.4.

employed in the Engineer Department at Large on June 30, 1911—Continued.

NASHVILLE, TENN.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1903	Jeffersonville, Ind.	Wood.	$3,650.00	(1)	Worthless.	Cumberland River.	Cumberland River.
1903	do.	do.	3,650.00	(1)	do.	do.	Do.
		do.	2,814.19	$2,000.00	Fair.	do.	Do.
		do.	2,814.19	2,000.00	do.	do.	Do.
1903	Jeffersonville, Ind.	do.	1,440.00	(1)	Worthless.	do.	Do.
1903	do.	do.	1,440.00	(1)	do.	do.	Do.
		do.	4,367.82	3,200.00	Good.	do.	Do.
		do.	1,500.00	(1)	Worthless.	Obion and Forked Deer Rivers.	Obion and Forked Deer Rivers.
1903	Jeffersonville, Ind.	do.	1,503.00	(1)	do.	Cumberland River.	Cumberland River.
1903	do.	do.	1,503.00	(1)	do.	do.	Do.
1903	do.	do.	1,503.00	(1)	do.	do.	Do.
1903	do.	do.	1,503.00	(1)	do.	do.	Do.
1903	do.	do.	1,503.00	(1)	do.	do.	Do.
1903	do.	do.	1,503.00	(1)	do.	do.	Do.
		do.	2,332.16	1,500.00	Fair.	do.	Do.
		do.	2,592.29	1,500.00	do.	do.	Do.
		do.	2,569.30	1,500.00	do.	do.	Do.
		do.	2,819.30	1,800.00	do.	do.	Do.
		do.	2,569.30	1,500.00	do.	do.	Do.
		do.	1,198.71	600.00	do.	do.	Caney Fork River.
		do.	84.26	(1)	Worthless.	do.	Cumberland River.

NEW LONDON, CONN.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1897	Baltimore, Md.	Steel.	$24,973.32	$13,000.00	Good.	New London, Conn.	River and harbor works.
1899	New London, Conn.	Wood.	10,000.00	4,000.00	Poor.	do.	Fortification work.
1909	Darien, Conn.	do.	775.00	1,350.00	Good.	Surveying, etc., river and harbor works.	River and harbor works.

NEW ORLEANS, LA.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1904	Sparrows Point, Md.	Steel.		$260,000.00	Good.	Southwest Pass, Mississippi River.	Borrowed from New York district.
1905	New Orleans, La.	do.	$414,238.37	196,830.00	do.	do.	Southwest Pass, Mississippi River.
1909	do.	Wood.	39,812.45	39,812.45	do.	New Orleans district.	Various streams in the district.
1897	New York, N. Y.	Steel.	18,900.00	14,580.00	do.	Passes of the Mississippi River.	South and Southwest Passes, Mississippi River.
1876	New Orleans, La.	Wood.	3,500.00	2,500.00	do.	do.	Do.
1906	do.	Iron.	29,000.00	27,000.00	do.	do.	Do.
1901	Port Eads, La.	do.	10,000.00	7,000.00	do.	do.	Do.
1905	Patterson, La.	Wood.	8,000.00	10,500.00	do.	New Orleans district.	Removing water hyacinths, Louisiana and Texas.
1905	New Orleans, La.	do.	7,189.00	6,500.00	do.	Southwest Pass, Mississippi River.	Southwest Pass, Mississippi River.
1894	New York, N. Y.	do.		750.00	do.	Plaquemine, La.	Bayou Plaquemine, La.

[5] Formerly No. 150372, Chere Amie.
[6] Rebuilt 1905.
[7] Formerly No. 115599, Startle.
[8] Rebuilt 1906.

TABLE VI.—*Statement of floating plant owned by the United States and*

NEW ORLEANS, LA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 1	Steam pile driver	71.00	55	0	25	0	4	0	[1] 1896	Port Eads, La. New Orleans, La.
No. 2	Combination pile driver and derrick.	127.00	75	6	80	0	5	0	1910	Lake Charles, La.
No. 1	Steam derrick	78.00	68	0	24	0	5	0	[2] 1887	Port Eads, La.
No. 6	135-ton barge	55.00	100	0	22	0	5	0	1905	New Orleans, La.
No. 9	do	55.00	100	0	22	0	5	0	1905	Madisonville, La.
No. 10	do	55.00	100	0	22	0	5	0	1905	do
No. 11	do	55.00	100	0	22	0	5	0	1906	do
No. 12	do	55.00	100	0	22	0	5	0	1906	do
No. 13	112-ton barge	116.00	90	0	27	0	8	0	1904	Pearlington, Miss.
No. 14	do	116.00	90	0	27	0	8	0	1904	do
No. 15	do	116.00	90	0	27	0	8	0	(3)	Unknown.
No. 16	135-ton barge	56.00	100	0	22	0	5	0	1910	New Orleans, La.
No. 17	do	72.00	100	0	22	0	5	6	1910	do
No. 18	do	72.00	100	0	22	0	5	6	1910	do
No. 19	do	72.00	100	0	22	0	5	6	1910	do
No. 20	do	72.00	100	0	22	0	5	6	1910	do
No. 21	do	55.00	100	0	22	0	5	0	1910	do
No. 22	do	55.00	100	0	22	0	5	0	1910	do
No. 23	250-ton barge	60.00	120	0	24	0	6	0	(3)	Unknown
No. 24	do	60.00	120	0	24	0	6	0	(3)	do
No. 25	120-ton barge	65.00	60	0	22	0	5	6		Moss Point, Miss.

NEW ORLEANS, LA. (FOURTH MISSISSIPPI RIVER DISTRICT.)

Name or number.	Class and description.	Displacement.	Length Ft.	Length in.	Beam Ft.	Beam in.	Depth Ft.	Depth in.	When.	Where.
Alpha [4]	Quarter boat		79	6	20	6	3	6	1884	St. Louis, Mo.
Gamma [4]	do		130	0	31	6	3	4	1888	Simmsport, La.
New Orleans	Quarter boat (creosoted).	237.00	166	0	30	0	4	3	1889	New Orleans, La.
Natchez	do	198.00	140	0	30	0	4	0	1908	do
Baton Rouge	do	198.00	140	0	30	0	4	0	1910	do
St. Joseph	do	198.00	140	0	30	0	4	0	1910	do
Bayou Goula	do	198.00	140	0	30	0	4	0	1911	do
Bayou Sara	do	198.00	140	0	30	0	4	0	1911	do
Port Hudson	do	68.00	80	0	22	0	4	4	1911	do
Torras	do	68.00	80	0	22	0	4	4	1911	do
Lake Borgne	do	68.00	80	0	22	0	4	4	1910	do
The Ram	Self-propelling hydraulic dredge.	419.00	125	0	30	0	7	6	1893	Jeffersonville, Ind.
Grader No. 1	Hydraulic grader	236.00	124	0	30	0	7	7	1900	New Orleans, La.
Grader No. 2	do	236.00	124	0	80	0	7	7	1910	do
Floating derrick No. 1	Steam power	135.00	100	0	30	0	3	6	1908	do
Floating derrick No. 2	do	135.00	100	0	30	0	3	6	1910	do
Gen. John Newton	Stern-wheel steamboat	221.00	149	0	24	0	7	6	1899	Dubuque, Iowa
Plaquemine	do	300.00	136	0	28	0	5	0	1910	Jeffersonville, Ind.
Teche	do	90.00	100	0	20	4	4	6	1911	do
Tensas	do	78.00	93	6	20	4	4	0	1905	Chicago, Ill.
Morganza [5]	Tugboat	180.00	92	0	19	0	8	8	1892	Philadelphia, Pa.
Tunica [6]	do	205.00	90	0	19	0	9	8	1898	Baltimore, Md.
Marengo [7]	do	137.00	80	0	18	2	8	8	1892	do
Manchac [8]	do	113.00	78	0	16	0	7	0	1886	Paducah, Ky.

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[1] Rebuilt 1910.

[2] Rebuilt 1903.

[3] Unknown.

[4] Condemned and sold.

employed in the Engineer Department at Large on June 30, 1911—Continued.

NEW ORLEANS, LA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1901	Port Eads, La.	Wood.	$3,000.00	$4,000.00	Good.	South Pass, Mississippi River.	South Pass, Mississippi River.
1910	New Orleans, La.	...do...	9,192.06	9,000.00	...do...	Southwest Pass, Mississippi River.	Southwest Pass, Mississippi River.
1901	Port Eads, La.	...do...	2,000.00	2,500.00	...do...	South Pass, Mississippi River.	South Pass, Mississippi River.
1905	New Orleans, La.	...do...	2,250.00	1,750.00	...do...	.....do	Do.
1905	.....do	...do...	2,800.00	1,500.00	...do...	.....do	Do.
1905	.....do	...do...	2,800.00	1,700.00	...do...	.....do	Do.
1906	.....do	...do...	2,800.00	1,800.00	...do...	.....do	Do.
1906	.....do	...do...	2,800.00	1,600.00	...do...	.....do	Do.
1906	.....do	...do...	4,500.00	2,000.00	Fair...	Southwest Pass, Mississippi River.	Southwest Pass, Mississippi River.
1906	.....do	...do...	4,500.00	2,000.00	...do...	.....do	Do.
1906	.....do	...do...	5,000.00	2,000.00	...do...	.....do	Do.
1910	.....do	...do...	2,410.50	2,250.00	Good.	South Pass, Mississippi River.	South Pass, Mississippi River.
1910	.....do	...do...	2,410.50	2,410.50	...do...	Southwest Pass, Mississippi River.	Southwest Pass, Mississippi River.
1910	.....do	...do...	2,410.50	2,410.50	...do...	.....do	Do.
1910	.....do	...do...	2,410.50	2,410.50	...do...	.....do	Do.
1910	.....do	...do...	2,462.40	2,410.00	...do...	.....do	Do.
1910	.....do	...do...	2,462.40	2,250.00	...do...	South Pass, Mississippi River.	South Pass, Mississippi River.
1910	.....do	...do...	2,462.40	2,250.00	...do...	.....do	Do.
1910	.....do	...do...	1,200.00	1,200.00	Fair...	Keystone Lock...	Bayou Teche, La.
1910	.....do	...do...	1,200.00	1,200.00	...do...	.....do	Do.
1910	.....do	...do...	1,350.00	1,350.00	Good.	.....do	Do.

NEW ORLEANS, LA. (FOURTH MISSISSIPPI RIVER DISTRICT.)

......	......	Wood.	$2,500.00	$100.00	Bad...	Surveys	Improving Mississippi River, fourth district.
......	......	...do...	4,500.00	300.00	...do...	Bank revetment.	Do.
......	......	...do...	10,000.00	8,700.00	Good.	.....do	Do.
......	......	...do...	9,000.00	8,700.00	...do...	.....do	Do.
......	......	...do...	10,000.00	9,600.00	...do...	.....do	Do.
......	......	...do...	10,000.00	9,600.00	...do...	.....do	Do.
......	......	...do...	10,000.00	10,000.00	...do...	.....do	Do.
......	......	...do...	10,000.00	10,000.00	...do...	.....do	Do.
......	......	...do...	3,500.00	3,500.00	...do...	Surveys	Do.
......	......	...do...	3,500.00	3,500.00	...do...	.....do	Do.
......	......	...do...	3,500.00	3,500.00	...do...	Levee construction.	Do.
......	......	Steel.	69,500.00	41,700.00	...do...	Dredging channel.	Improving Red and Atchafalaya and Red Rivers, La.
......	......	Wood.	20,000.00	16,200.00	...do...	Bank revetment.	Improving Mississippi River, fourth district.
......	......	...do...	20,000.00	20,000.00	...do...	.....do	Do.
......	......	...do...	6,000.00	5,000.00	...do...	.....do	Do.
......	......	...do...	5,000.00	5,000.00	...do...	.....do	Do.
......	......	Steel.	29,138.00	24,500.00	...do..	.....do	Do.
......	......	...do..	38,700.00	38,700.00	...do..	.....do	Do.
......	......	...do..	16,850.00	16,850.00	...do..	.....do	Do.
......	......	...do..	11,120.00	11,120.00	...do..	.....do	Do.
1902	New York, N. Y.	...do..	30,000.00	24,500.00	...do..	.....do	Do.
1898	Baltimore, Md.	...do..	22,000.00	17,800.00	...do..	.....do	Do.
1902	.....do	...do..	15,000.00	12,300.00	...do..	.....do	Do.
1887	Paducah, Ky.	Wood.	6,555.00	2,500.00	Bad...	.....do	Do.

[5] Light draft: Forward, 6 feet; aft, 9 feet 3 inches. Length at water line, 87 feet.

[6] Light draft: Forward, 8 feet 1 inch; aft, 9 feet 7 inches. Length at water line, 86 feet 6 inches.

[7] Light draft: Forward, 6 feet 2 inches; aft, 8 feet 1 inch. Length at water line, 75 feet 4 inches.

[8] Light draft: Forward, 4 feet 4 inches; aft, 8 feet 6 inches. Length at water line, 76 feet 2 inches.

TABLE VI.—*Statement of floating plant owned by the United States and*

NEW ORLEANS, LA. (FOURTH MISSISSIPPI RIVER DISTRICT)—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.in.*		*Ft.in.*		*Ft.in.*			
Beatrice	Gasoline launch		30	0	6	6	3	2	1906	St. Louis, Mo
Dry dock	Ordinary type		104	0	30	0	9	6	1896	New Orleans, La
Barataria	Levee-building machine	300.00	102	0	36	0	6	0	1908	do
No. 1	500-ton decked barge (creosoted).		124	0	30	0	7	7	1908	do
No. 2	do		124	0	30	0	7	7	1908	do
No. 3	do		124	0	30	0	7	7	1908	do
No. 4	do		124	0	30	0	7	7	1910	do
No. 5	do		124	0	30	0	7	7	1904	Pascagoula, Miss
No. 6	do		124	0	30	0	7	7	1904	do
No. 7	do		124	0	30	0	7	7	1904	do
No. 8	do		124	0	30	0	7	7	1903	New Orleans, La
No. 9	do		124	0	30	0	7	7	1904	Pascagoula, Miss
No. 10	do		124	0	30	0	7	7	1900	Elizabeth, Pa
No. 11	do		124	0	30	0	7	7	1900	do
No. 12	do		124	0	30	0	7	7	1903	Pascagoula, Miss
No. 13	do		124	0	30	0	7	7	1900	Elizabeth, Pa
No. 14	do		124	0	30	0	7	7	1910	New Orleans, La
No. 15	do		124	0	30	0	7	7	1910	do
No. 16	do		124	0	30	0	7	7	1910	do
No. 17	do		124	0	30	0	7	7	1910	do
No. 18	do		124	0	30	0	7	7	1910	do
No. 19	do		124	0	30	0	7	7	1905	do
No. 20	do		124	0	30	0	7	7	1908	do
No. 21	do		124	0	30	0	7	7	1908	do
No. 22	do		124	0	30	0	7	7	1907	do
No. 23	do		124	0	30	0	7	7	1907	do
No. 24	do		124	0	30	0	7	7	1907	do
No. 25	do		124	0	30	0	7	7	1908	do
No. 26	do		124	0	30	0	7	7	1906	do
No. 27	do		124	0	30	0	7	7	1907	do
No. 28	do		124	0	30	0	7	7	1910	do
No. 29	do		124	0	30	0	7	7	1900	Elizabeth, Pa
No. 30	do		124	0	30	0	7	7	1910	New Orleans, La
No. 33	do		124	0	30	0	7	7	1903	Pascagoula, Miss
No. 34	do		124	0	30	0	7	7	1903	do
No. 35	do		124	0	30	0	7	7	1903	do
No. 36	do		124	0	30	0	7	7	1904	do
No. 37	do		124	0	30	0	7	7	1904	do
No. 38	do		124	0	30	0	7	7	1904	do
No. 39	do		124	0	30	0	7	7	1904	do
No. 40	do		124	0	30	0	7	7	1904	Pascagoula, Miss
No. 41	do		124	0	30	0	7	7	1904	do
No. 42	do		124	0	30	0	7	7	1904	do
No. 43	do		124	0	30	0	7	7	1906	New Orleans, La
No. 44	do		124	0	30	0	7	7	1907	do
No. 45	do		124	0	30	0	7	7	1907	do
No. 46	do		124	0	30	0	7	7	1908	do
No. 47	do		124	0	30	0	7	7	1908	do
No. 48	do		124	0	30	0	7	7	1909	do
No. 49	do		124	0	30	0	7	7	1909	do
No. 50	do		124	0	30	0	7	7	1909	do
No. 51	do		124	0	30	0	7	7	1909	do
No. 52	do		124	0	30	0	7	7	1909	do
No. 53	do		124	0	30	0	7	7	1909	do
No. 54	do		124	0	30	0	7	7	1910	do
No. 4 C	500-ton decked barge		124	0	30	0	7	7	1900	Madisonville, La
No. 16 C	do		124	0	30	0	7	7	1899	Slidell, La
No. 17 C	do		124	0	30	0	7	7	1893	New Orleans, La
No. 18 C	do		124	0	30	0	7	7	1893	do
No. 28 C	do		124	0	30	0	7	7	1899	Slidell, La
No. 30 C	do		124	0	30	0	7	7	1900	Madisonville, La

employed in the Engineer Department at Large on June 30, 1911—Continued.

NEW ORLEANS, LA. (FOURTH MISSISSIPPI RIVER DISTRICT)—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$1,750.00	$1,000.00	Fair	Surveys	Improving Mississippi River, fourth district.
		do	2,787.00	250.00	Bad	New Orleans, La.	Do.
		do	22,000.00	20,300.00	Good	Levee construction.	Do.
		do	4,250.00	4,400.00	do	Bank revetment.	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	3,800.00	3,000.00	do	do	Do.
		do	3,800.00	3,000.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	3,800.00	3,000.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,675.00	3,800.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,725.00	4,200.00	do	do	Do.
		do	4,725.00	4,200.00	do	do	Do.
		do	4,725.00	4,200.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,675.00	4,200.00	do	do	Do.
		do	4,725.00	4,200.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	3,800.00	3,000.00	do	do	Do.
		do	4,400.00	4,400.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,000.00	3,600.00	do	do	Do.
		do	4,400.00	3,600.00	do	do	Do.
		do	4,675.00	4,000.00	do	do	Do.
		do	4,725.00	4,400.00	do	do	Do.
		do	4,725.00	4,400.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	4,250.00	4,400.00	do	do	Do.
		do	5,000.00	4,600.00	do	do	Do.
		do	5,000.00	4,600.00	do	do	Do.
		do	5,000.00	4,600.00	do	do	Do.
		do	5,000.00	4,600.00	do	do	Do.
		do	5,000.00	4,600.00	do	do	Do.
		do	5,600.00	5,000.00	do	do	Do.
		do	3,750.00	100.00	Bad	do	Do.
		do	3,674.00	100.00	do	do	Do.
		do	3,650.00	100.00	do	do	Do.
		do	3,650.00	100.00	do	do	Do.
		do	3,674.00	100.00	do	do	Do.
		do	3,750.00	100.00	do	do	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
NEWPORT, R. I.							
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Gedney	Seagoing hopper dredge.	1,500.00	156 6	36 6	15 6	1887	Wilmington, Del.
Cora	Steam dispatch boat.	220.00	140 0	23 0	12 0	1885	Brooklyn, N. Y.
Gazelle	Gasoline screw schooner.	73.00	59 0	17 6	7 0	1896	Noank, Conn.
U. S. Engineers	Naphtha launch	63.00	30 0	6 5	3 1	1893	Morris Heights, N.Y.
NEW YORK, N. Y. (SUPERVISOR OF NEW YORK HARBOR).							
Argus	Patrol vessel	134.00	80 9	15 5	9 0	1889	New York, N. Y.
Nimrod	do	245.00	95 0	21 0	8 1	1890	Noank, Conn.
Lamont	do	275.00	100 0	22 0	12 4	1895	Camden, N. J.
Lookout	Naphtha launch	2.00	26 0	4 0	2 6	1896	New York, N. Y.
Scout	Patrol vessel	183.00	96 0	19 0	11 5	1896	Camden, N. J.
Vigilant	do	275.00	101 2	22 0	12 0	1900	Elizabeth, N. J.
Cerberus	do	200.00	100 0	21 0	12 4	1905	Camden, N. J.
NEW YORK, N. Y., FIRST DISTRICT.							
Wah-ta-Wah	Motor cutter	35.33	80 0	15 0	5 2	1911	Greenport, N. Y.
Motor launch W	Tender on Wah-ta-Wah.		16 4	4 8	0 10	1911	Amesbury, Mass.
Marie	Gasoline		29 0	8 0	4 0	1906	Unknown.
Sweep	Sweep scow	85.00	56 3	26 2	6 0	1908	New London, Conn.
Hudson	Drill scow		71 0	24 0	7 0	1879	Brooklyn, N. Y.
No name	Pile driver, with engine and air compressor.		43 0	20 0	3 9		
No. 1	Rowboat		15 0	4 4	1 6	1894	Albany, N. Y.
No. 2	Skiff		15 0	4 0	1 3	1904	Castleton, N. Y.
No. 3	do		15 9	5 6	1 6	1903	do
No. 4	Rowboat		16 0	4 6	2 2	1907	Albany, N. Y.
No. 5	do		15 0	4 0	1 6	1907	New York, N. Y.
No. 6	do		15 0	4 0	1 6	1907	do
No. 7	do		15 0	4 0	1 6	1908	do
No. 8	do		15 0	4 0	1 6	1909	do
NEW YORK, N. Y., SECOND DISTRICT.							
Atlantic	Seagoing hopper dredge.	2,674.00	274 0	47 6	25 0	1904	Sparrows Point, Md.
Manhattan	do	2,605.00	274 0	47 6	25 0	1904	do
Raritan	do	2,930.00	276 0	47 6	25 0	1908	do
Navesink	do	2,931.00	276 0	47 6	28 0	1908	do
Manisees	Steamer	225.00	102 0	22 0	9 0	1898	Noank, Conn.
Engineer	Tug	130.00	91 0	18 0	7 6	1876	New York, N. Y.
General Ingalls	Steam launch	14.00	43 0	8 2	4 8	1896	Jersey City, N. J.
Schuyler	Gasoline launch	1.20	25 0	5 8	0 22	1902	Brooklyn, N. Y.

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[1] Boilers bad; hull fair.

[2] In purchase of steam tug Scout.

employed in the Engineer Department at Large on June 30, 1911—Continued.

NEWPORT, R. I.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1892	New York	Wood.	$72,500.00	$33,000.00	Fair	Southern coast of Massachusetts and Rhode Island.	Rivers and harbors.
1893	Brooklyn	do	13,900.00	31,500.00	Good	do	Do.
1910	Block Island, R. I.	do	3,800.00	4,000.00	do	do	Do.
1893	Morris Heights, N. Y.	do	2,090.00	400.00	Poor	do	Do.

NEW YORK, N. Y. (SUPERVISOR OF NEW YORK HARBOR).

		Iron	$21,250.00	$1,000.00	Bad	New York Harbor	Prevention of deposits, Harbor of New York.
1890	New York, N. Y	Wood.	37,000.00	5,000.00	(1)	do	Do.
		Steel	37,500.00	25,000.00	Very good.	do	Do.
1896	New York, N. Y.	Wood.	(2)	500.00	Good	do	Do.
		Steel	35,550.00	15,000.00	do	do	Do.
		do	44,700.00	26,000.00	(3)	do	Do.
		do	43,740.57	40,000.00	Very good.	do	Do.

NEW YORK, N. Y., FIRST DISTRICT.

		Wood.	$15,460.00	$18,000.00	Good	Rivers and harbors vicinity New York City.	New York district No. 1.
1911	New York, N. Y.	do	216.50	216.50	do	do	Do.
1907	do	do	1,100.00	1,500.00	do	do	Do.
1909	do	do	8,058.00	7,000.00	do	do	Do.
		do	15,000.00	2,000.00	Poor	Not in commission.	Do.
1906	Albany, N. Y.	do	3,000.00	1,000.00	do	Hudson River, N. Y.	Do.
1899	do	do	50.00	5.00	Very poor.	do	Do.
1906	do	do	15.00	5.00	do	do	Do.
1906	do	do	17.00	5.00	Poor	do	Do.
1907	do	do	80.00	70.00	Good	do	Do.
1907	New York, N. Y.	do	110.00	100.00	do	River and harbor works New York, district No. 1.	Do.
1907	do	do	110.00	100.00	do	do	Do.
1908	do	do	100.00	90.00	do	do	Do.
1909	do	do	100.00	90.00	do	do	Do.

NEW YORK, N. Y., SECOND DISTRICT.

		Steel	$341,577.00	$240,000.00	Good	South West Pass, La.	New York Harbor.
		do	341,577.00	240,000.00	do	Delaware River	Do.
		do	397,600.00	330,000.00	do	New York Harbor, N. Y.	Do.
		do	393,340.00	330,000.00	do	do	Do.
1900	Peacedale, R. I.	Wood.	18,500.00	15,000.00	do	do	New York Harbor, two-thirds; Gowanus Bay, one-third.
	New York, N. Y.	do	25,000.00	4,000.00	Fair	do	New York Harbor.
1896	Jersey City	do	4,500.00	1,800.00	do	do	Do.
1902	Brooklyn, N. Y.	do	1,110.80	850.00	Good	Long Island Sound.	Fortifications, Forts Schuyler, Slocum, and Totten, N. Y.

[3] New engines and boilers being installed.

TABLE VI.—*Statement of floating plant owned by the United States and*

NORFOLK, VA.

Name or number.	Class and description.	Displacement.	Dimensions. Length.		Dimensions. Beam.		Dimensions. Depth.		Built. When.	Built. Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Roanoke	Combination snag boat and bucket dredge.	232.00	100	0	24	0	5	10	1895	Petersburg, Va.
McGregor[1]	Steam yacht	79.00	69	0	14	3	7	1	1897	Middletown, Conn.
No Name	Floating pump	114.00	60	0	23	0	6	0	1902	Richmond, Va.
Rainbow	Gasoline launch	1.00	15	0	4	4	2	8		Detroit, Mich.

OSWEGO, N. Y.

Name or number.	Class and description.	Displacement.	Length. Ft.	in.	Beam. Ft.	in.	Depth. Ft.	in.	When.	Where.
Frontenac	Dredge		76	0	26	0	7	0		
No. 1	Derrick scow		74	0	26	0	5	0	1892	Oswego
No. 2	do		76	0	26	0	6	3	1905	do
No. 3	Material scow		68	0	20	0	5	6	1905	do
No. 4	do		58	0	20	0	5	6	1905	do
No. 5	do		40	0	12	8	3	2	1898	do
No. 6	do		68	0	20	0	5	6	1907	do
No. 7	Dump scow		75	0	20	0	6	6	1907	do
No. 8	do		75	0	20	0	6	6	1907	do
No. 9	Derrick scow		150	0	36	0	8	9	1908	do
No. 10	Stone scow		130	0	36	0	8	9	1908	do
No. 11	do		130	0	36	0	8	9	1908	do
No. 12	Derrick scow		100	0	32	0	9	4	1909	do
No. 13	Stone scow		100	0	32	0	9	4	1909	do
Ontario	Launch		27	0	6	0	3	0	1904	do
Brewerton	Tug		58	4	15	7	8	11	1893	Benton Harbor
W. H. Lee	Steam lighter		124	8	29	7	11	7	1889	Brooklyn, N. Y.

PHILADELPHIA, PA.

Name or number.	Class and description.	Displacement.	Length. Ft.	in.	Beam. Ft.	in.	Depth. Ft.	in.	When.	Where.
Cataract	Rehandling machine	750.00	140	6	40	4	10	7	1905	Baltimore, Md.
Delaware	Sea-going hopper dredge	2,750.00	315	0	52	0	22	6	1905	Sparrows Point, Md.
Do	Naphtha launch	2.00	20	2	6	8	3	2	1908	Camden, N. J.
Dorothy	do	1.50	22	2	6	11½	1	4½	1906	Paulsboro, N. J.
Gen. A. A. Humphreys.	Tug	50.00	71	6	16	0	7	0	1880	Tottenville, N. Y.
Gen. John Newton	Drill scow	750.00	127	0	58	0	9	6	1869	Brooklyn, N. Y.
Hell Gate	Dredge	720.00	110	0	35	0	12	0	1869	New York, N. Y.
Manhattan	Sea-going hopper dredge	2,665.00	288	0	47	6	25	0	1904	Sparrows Point, Md.
Mary	Lighter	15.00	37	0	13	8½	4	0	1895	Camden, N. J.
Observer	Quarter boat	25.00	50	0	20	0		10	1896	do
Philadelphia	Tug	55.00	67	0	16	0	7	6	1894	Wilmington, Del.
Rattler	Derrick scow	240.00	70	0	30	0	7	0	1908	Camden, N. J.
Schuylkill	Naphtha launch	16.00	54	0	12	0	3	6	1901	Philadelphia, Pa.
Scorpion	do	1.50	23	0	7	0	4	0		
Scow No. 1	Dump scow	572.00	110	0	30	6	11	0	1885	Brooklyn, N. Y.
Scow No. 2	do	643.00	115	0	32	6	12	0	1890	do
Scow No. 3	do	330.00	78	0	26	0	9	0	1889	do
Scow No. 4	do	100.00	65	0	20	0	7	3	1879	New York, N. Y.
Scow No. 5	Derrick scow	50.00	38	0	18	0	6	0	1875	Brooklyn, N. Y.
Scow No. 6	Coal and water scow	90.00	50	0	20	0	6	0	1910	Camden, N. J.
Uncle Sam	Centrifugal-pump dredge	450.00	85	0	34	0	7	0	1899	Jersey City, N. J.
Vidette	Tug	200.00	99	1	21	0	10	0	1898	Baltimore, Md.

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[1] Formerly 92806.

employed in the Engineer Department at Large on June 30, 1911—Continued.

NORFOLK, VA.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$15,321.02	$6,000.00	Fair	Out of commission.	Improving Roanoke River, N. C.
1903	Baltimore, Md	do	10,000.00	5,000.00	do	Hampton Roads and tributaries.	Improving Hampton Roads, Va.
1904	Richmond, Va	do	4,800.00	1,500.00	do	Fort Monroe, Va.	Fort Monroe, Va.
1911	Petersburg, Va	Metal	125.00	125.00	Good	Appomattox River at Petersburg, Va.	Improving Appomattox River, Va.

OSWEGO, N. Y.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1891	Oswego	Wood.	$14,650.00	$4,500.00	Fair	Great Sodus Bay, N. Y.	
		do	2,000.00	1,800.00	Good	do	
		do	5,000.00	4,000.00	do	Little Sodus Bay, N. Y.	
		do	1,250.00	1,000.00	do	Great Sodus Bay, N. Y.	
		do	1,250.00	1,000.00	do	do	
		do	450.00	150.00	Poor	Oswego, N. Y	
		do	1,500.00	1,200.00	Good	Little Sodus Bay, N. Y.	
		do	3,100.00	2,600.00	do	Great Sodus Bay, N. Y.	
		do	3,100.00	2,600.00	do	do	
		do	10,500.00	9,500.00	do	Oswego, N. Y	
		do	5,500.00	5,000.00	do	do	
		do	5,500.00	5,000.00	do	do	
		do	9,500.00	9,500.00	do	do	
		do	6,500.00	6,500.00	do	do	
		do	525.00	350.00	do	do	
1909	Bay City, Mich	do	2,950.00	8,500.00	do	do	
1910	New York	do	19,700.00	21,500.00	do	do	

PHILADELPHIA, PA.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1906	Baltimore, Md	Wood.	$80,600.00	$60,000.00	Good	Delaware River	Delaware River Pa. and N. J.
		Steel hull.	392,134.13	263,000.00	do	do	Do.
1908	Camden, N. J	Wood.	450.00	260.00	Fair	do	Do.
1907	do	do	275.00	195.00	Good	do	Do.
		do	12,000.00	6,400.00	Fair	do	East River and Hell Gate, N. Y.
		do	100.000.00	7,500.00	Obsolete.	do	Do.
1889	New York, N. Y	do	25,000.00	16,000.00	Fair	do	Do.
		Steel hull.	327,187.98	249,000.00	Good	do	New York Harbor.
1904	Philadelphia, Pa	Wood.	300.00	130.00	Poor	do	Delaware River, Pa. and N. J.
1896	Camden, N. J	do	1,161.00	700.00	Good	do	Do.
1894	Wilmington, Del.	Steel hull.	15,997.51	9,000.00	do	do	Philadelphia Harbor.
1908	Camden, N. J	Wood.	7,187.28	6,300.00	do	do	Delaware River, Pa. and N. J.
1901	Philadelphia, Pa	do	6,000.00	3,750.00	do	do	Do.
1909	Port Penn, Del.	do	200.00	155.00	do	do	Do.
1905	New York, N. Y	do	4,600.00	1,800.00	Poor	do	Do.
1905	do	do	5,200.00	3,000.00	Fair	do	Do.
		do	4,000.00	1,750.00	do	do	East River and Hell Gate, N. Y.
		do	2,000.00	1,800.00	do	do	Do.
		do	3,000.00	1,550.00	Good	do	Do.
1910	Camden, N. J	do	2,245.00	2,050.00	do	do	Delaware River Pa. and N. J.
1904	Jersey City, N.J	do	18,855.94	15,000.00	do	do	Do.
1898	Baltimore, Md	Steel hull.	35,100.00	24,000.00	do	do	Harbor of Refuge, Delaware Bay, Del.

TABLE VI.—*Statement of floating plant owned by the United States and*

PITTSBURGH, PA.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Albatross	Naphtha launch (propeller).	1.70	30 0	5 10	2 6	1887	New York, N. Y
Luzon	do	12.00	53 0	9 4	4 6	1901	do
No. 1	Dipper dredge (nonpropelling).	295.00	85 0	32 0	6 2	1903	Jeffersonville, Ind
No. 2	do	197.00	86 6	30 0	4 8	1905	Parkersburg, W. Va.
Slackwater [2]	Stern-wheel repair boat	229.00	120 0	26 4	4 3	1902	Marietta, Ohio
Swan [3]	Stern-wheel snag and repair boat.	264.00	159 0	31 4	4 6	1903	Pittsburgh, Pa
T. P. Roberts	Stern-wheel towboat	206.00	115 0	22 8	4 0	1906	Marietta, Ohio
Wenonah [4]	Steam launch (propeller).	32.00	65 0	8 0	5 8	1894	Pittsburgh, Pa
Deluge	Steam pump boat (nonpropelling).	170.80	80 0	21 0	4 2	1898	Elizabeth, Pa
No. 1 O. R		([5])	80 0	22 0	4 2	1910	United States boat yard, Lock 4, Pa.
Mary Ann	Crane boat (nonpropelling).	161.00	115 0	26 10	3 0	1892	Monongahela, Pa
No. 1	Derrick boat (nonpropelling).	47.00	48 0	22 0	3 9	1899	do
No. 2	do	70.00	70 0	26 0	3 8	1902	United States boat yard, Lock 4, Pa.
No. 3	do	104.00	70 0	26 0	3 6	1905	do

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[1] Secondhand.
[2] Formerly No. 116011.
[3] Formerly United States engineer boat Gen. Theodore Schwan.

employed in the Engineer Department at Large on June 30, 1911—Continued.

PITTSBURGH, PA.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1892	Cincinnati, Ohio	Wood.	$740.00	$500.00	Poor..	Out of commission and laid up, Lock 4, Pa., United States boat yard.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
1901	NewYork, N. Y.	...do...	4,660.00	2,200.00	Fair...	Pittsburgh, Pa., district, Monongahela, Allegheny, and Ohio Rivers.	Improving harbor at Pittsburgh, Pa.
1903	Pittsburgh, Pa..	...do...	17,565.00	5,000.00	Poor..	.....do...........	Improving Monongahela River, W. Va., Locks 3, 6 etc.
1907	.....do..........	...do...	[1] 17,000.00	17,000.00	Good .	.....do...........	Operating and care of canals and other works of navigation, indefinite, Monongahela and Ohio Rivers.
1902	.....do..........	...do...	13,500.00	9,000.00	Fair...	.....do...........	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
1903	.....do..........	Steel..	51,800.00	28,500.00	...do...	.....do...........	Improving Monongahela River, W. Va., Locks 3, 6, etc.
1906	.....do..........	Wood.	17,370.00	14,000.00	Good..	.....do...........	Improving Monongahela River, W. Va., operating and care of canals, etc., Locks 10 to 15, and Monongahela River.
1900	.....do..........	Steel..	[1] 6,000.00	1,250.00	Fair...	.....do...........	Operating and care of canals and other works of navigation, indefinite, Ohio River.
1898	.....do..........	Wood.	6,000.00	1,800.00	...do...	Rebuilding Lock 1, Monongahela River.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
......	....	...do...	[6] 3,766.00	3,766.00	Good..	Locks 1 to 6, inclusive, Ohio River.	Operating and care of canals and other works of navigation, indefinite, Ohio River.
1897	Pittsburgh, Pa..	...do..	[7] 11,000.00	200.00	Bad...	Rebuilding Lock 1, Monongahela River.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
......	....	...do...	2,800.00	750.00	Poor..	.....do...........	Do.
......	....	...do...	3,300.00	2,000.00	Fair...	.....do...........	Do.
......	....	...do...	3,500.00	1,800.00	...do...	Locks 3, 4, and 5, Monongahela River.	Do.

[4] Formerly No. 81473.
[5] Hull only.
[6] Not equipped.
[7] Estimated.

TABLE VI.—*Statement of floating plant owned by the United States and*

PITTSBURGH, PA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Ohio No. 1	Derrick boat (nonpropelling).	110.00	71 0	30 0 26 0	4 0	1910	United States boat yard, Lock 4, Pa.
No. 1	Scraper boat (nonpropelling).	64.00	50 0	28 0	3 10	1910	....do
Nos. 1 and 2	Dump scows, 4 pockets (nonpropelling; 90 cubic yards).	....	70 2	20 10	6 9	1902	Cincinnati, Ohio
Nos. 3 and 4	....do	....	70 2	20 10	6 9	1905	Elizabeth, Pa
Nos. 5 and 6	....do	....	70 2	20 10	6 9	1907	United States boat yard, Lock 4, Pa.
No. 1	Pile-driver boat (nonpropelling).	68.30	50 0	26 0	3 6	1904	....do
No. 2	....do	50.80	50 0	26 0	3 6	1906	....do
No. 3	....do	....	50 6	20 9	3 3	....	....
No. 1	Quarter boat (nonpropelling).	44.00	85 0	22 0	3 6	1902	United States boat yard, Lock 4, Pa.
No. 2	....do	29.80	76 0	16 0	3 0	1904	Gallipolis, Ohio
	Manuevering (nonpropelling).	38.00	55 0	17 0	3 0	1895	Pittsburgh, Pa
	....do	41.00	56 0	18 0	3 0	1902	....do
	....do	41.00	56 0	18 0	3 0	1904	United States boat yard, Lock 4, Pa.
	....do	70.00	60 0	22 0	4 0	1906	....
	....do	54.00	60 0	20 0	4 0	1906	Glenosborn, Pa

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[1] Each.

[2] Secondhand; each.

employed in the Engineer Department at Large on June 30, 1911—Continued.

PITTSBURGH, PA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$6,785.00	$6,785.00	Good.	Lock 1, Ohio River.	Operating and care of canals and other works of navigation, indefinite, Ohio River.
		do.	3,675.00	3,600.00	do.	Locks 1 to 6, inclusive, Monongahela River.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
1902	Pittsburgh, Pa.	do.	[1] 3,600.00	[1] 800.00		Rebuilding at United States boat yard, Lock 4, Pa.	Improving Monongahela River, W. Va., Locks 3, 6, etc.
1907	do.	do.	[3] 3,000.00	[1] 1,600.00	Good.	Pittsburgh, Pa., district, Monongahela, Allegheny, and Ohio Rivers.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
		do.	[1] 3,500.00	[1] 2,100.00	do.	do.	Do.
		do.	3,500.00	1,800.00	Fair.	do.	Improving Monongahela River, Pa., Lock 2.
		do.	3,750.00	2,500.00	do.	do.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
1907	Pittsburgh, Pa.	do.	[3] 2,000.00	500.00	Bad (partly dismantled).	Out of commission and laid up, Lock No. 4, Pa., United States boat yard.	Dam at Herrs Island, Allegheny River, near Pittsburgh, Pa., Dams Nos. 2 and 3.
		do.	3,150.00	1,800.00	Fair.	Rebuilding Lock 1, Monongahela River.	Operating and care of canals and other works of navigation, indefinite, Monongahela River.
1904	Pittsburgh, Pa.	do.	[3] 625.00	150.00	Bad.	Out of commission and laid up, Lock 4, Pa., United States boat yard.	Improving Monongahela River, Pa., Lock 2.
		Steel.	[4] 5,000.00	900.00	do.	Lock 1, Ohio River.	Operating and care of canals and other works of navigation, indefinite, Ohio River.
		Wood.	4,000.00	1,800.00	Fair.	Lock 1, Allegheny River.	Dam at Herrs Island, Allegheny River, near Pittsburgh, Pa., Dam No. 1.
		do.	4,600.00	2,200.00	do.	Lock 6, Ohio River.	Improving Ohio River below Pittsburgh, Pa., Dam No. 6.
		do.	5,600.00	3,800.00	Good.	Lock 2, Ohio River.	Improving Ohio River below Pittsburgh, Pa., Dam No. 2.
		do.	6,000.00	4,360.00	do.	Lock 3, Ohio River.	Improving Ohio River below Pittsburgh, Pa., Dam No. 3.

[3] Secondhand.

[4] Estimated, hull, $1,988.

TABLE VI.—*Statement of floating plant owned by the United States and*

PITTSBURGH, PA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
	Maneuvering (nonpropelling).	58.50	60 0	22 0	3 8	1906	Legionville, Pa.
	do	65.00	60 0	22 0	3 8	1906	Merrill, Pa.
	do	65.00	60 0	22 0	3 8	1910	Pittsburgh, Pa.
No. 1	Flat	155.00	90 0	16 0	6 0		
No. 2	do		46 6	11 0	1 10	1897	United States boat yard, Lock 4, Pa.
No. 3	do		46 6	11 0	1 8	1897	do
No. 6	do	156.00	90 6	16 0	6 0		
No. 7	do	156.00	90 6	16 0	6 0		
No. 8	do	175.00	90 0	18 0	6 0	1902	United States boat yard, Lock 4, Pa.
No. 9	do	175.00	90 0	18 0	6 0	1902	do
No. 10	do	175.00	90 0	18 0	6 0	1902	do
No. 11	do	175.00	90 0	18 0	6 0	1902	do
No. 12	do	217.00	100 0	20 0	6 0	1905	do
No. 13	do	260.00	100 0	24 0	6 0	1905	do
No. 15	do	217.00	100 0	20 0	6 0	1905	do
No. 16	do	217.00	100 0	20 0	6 0	1905	do
No. 17	do	260.00	100 0	24 0	6 0	1906	do
No. 18	do		48 0	11 0	2 1	1901	do
No. 20	do	175.00	90 0	18 0	6 0	1908	do
No. 21	do		47 0	11 0	2 1	1897	do
No. 22	do		38 0	11 0	2 0	1904	do
No. 23	do		38 0	11 0	2 0	1904	do
No. 24	do		38 0	11 0	2 0	1904	do
No. 25	do		38 0	11 0	2 0	1904	do
No 26	do		38 0	11 0	2 0	1904	do
No. 27	do		38 0	11 0	2 0	1904	do
No. 28	do		24 0	9 0	1 7	1908	do
No. 29	do		48 0	12 0	2 4	1908	do
No. 30	do		38 0	11 0	2 0	1909	do

employed in the Engineer Department at Large on June 30, 1911—Continued.

PITTSBURGH, PA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$5.000,00	$4,360.00	Good..	Lock 4, Ohio River.	Improving Ohio River below Pittsburgh, Pa., Dam No. 4.
......	....	...do...	4,250.00	3,000.00	...do...	Lock 5, Ohio River.	Improving Ohio River below Pittsburgh, Pa., Dam No. 5.
1910	Pittsburgh, Pa..	...do...	5,101.00	5,101.00	...do...	Lock 8, Ohio River.	Improving Ohio River below Pittsburgh, Pa., Dam No. 8.
1899	.....do...........	...do...	[1]400.00	825.00	...do...	Rebuilding Lock 1, Monongahela River.	Operating and care of canals and other works of navigation, indefinite, as applied to Monongahela River.
......	....	...do...	190.00	135.00	...do...	.....do...........	Do.
......	....	...do...	190.00	35.00	Fair...	Rebuilding at United States boat yard, Lock 4, Monongahela River, Pa.	Do.
1899	Roscoe, Pa.......	...do...	750.00	100.00	....	.....do...........	Do.
1899	.....do...........	...do...	750.00	250.00	....	.....do...........	Do.
......	....	...do...	1,300.00	700.00	Fair...	.....do...........	Do.
......	....	...do...	1,300.00	400.00	...do...	.....do...........	Do.
......	....	...do...	1,300.00	400.00	Poor..	Rebuilding Lock 1.	Do.
......	....	...do...	1,300.00	900.00	Fair...	.....do...........	Do.
......	....	...do...	1,600.00	800.00	...do...	United States boat yard, Lock 4, Monongahela River, Pa.	Do.
......	....	...do...	1,700.00	800.00	...do...	.....do...........	Do.
......	....	...do...	1,600.00	1,000.00	...do...	.....do...........	Do.
......	....	...do...	1,600.00	1,050.00	Good..	Rebuilding Lock 1, Monongahela River.	Do.
......	....	...do...	1,700.00	1,100.00	Fair...	United States boat yard, Lock 4, Monongahela River, Pa.	Do.
......	....	...do...	225.00	150.00	Good..	Lock 5, Monongahela River.	Do.
......	....	...do...	1,300.00	900.00	Fair...	Rebuilding Lock 1, Monongahela River.	Do.
......	....	...do...	200.00	40.00	...do...	Lock 7, Monongahela River.	Do.
......	....	...do...	175.00	70.00	Good..	Lock 10, Monongahela River.	Do.
......	....	...do...	175.00	70.00	...do...	Lock 11, Monongahela River.	Do.
......	....	...do...	175.00	70.00	...do...	Lock 12, Monongahela River.	Do.
......	....	...do...	175.00	70.00	...do...	Lock 13, Monongahela River.	Do.
......	....	...do...	175.00	70.00	...do...	Lock 14, Monongahela River.	Do.
......	....	...do...	175.00	70.00	...do...	Lock 15, Monongahela River.	Do.
......	....	...do...	120.00	80.00	...do...	Lock 8, Monongahela River.	Do.
......	....	...do...	210.00	170.00	Fair...	Lock 1, Monongahela River.	Do.
......	....	...do...	187.00	175.00	Good..	Lock 9, Monongahela River.	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

PITTSBURGH, PA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 31	Flat		48	0	11	0	2	0	1909	United States boat yard, Lock 4, Pa.
No. 32	do		48	0	11	0	2	0	1909	do
No. 33	do		36	0	12	0	2	0	1909	do
No. 34	do		48	0	12	0	2	0	1910	do
No. 101	do		35	0	12	0	1	10	1910	do
No. 102	do		30	0	10	0	3	0	1902	Merrill, Pa.
No. 103	do		20	0	5	6	1	6	1900	do
No. 104	do		45	0	12	0	2	1	1905	United States boat yard, Lock 4, Pa.
No. 105	do		48	0	11	0	2	6	1905	do
No. 107	do	217.00	100	6	20	0	6	0	1905	do
No. 108	do		28	0	8	0	1	6		
No. 109	do		35	0	12	0	2	0	1911	United States boat yard, Lock 4, Pa.
No. 111	do		50	6	11	0	2	2		
No. 113	do		35	0	14	0	2	0		
No. 114	do		48	0	12	0	2	6	1908	United States boat yard, Lock 4, Pa.
No. 115	do		48	0	11	0	2	6	1908	do
No. 202	do		41	0	12	0	2	6		
No. 203	do		41	0	12	0	2	6		
No. 204	do	87.00	80	0	16	0	4	6		
	Skiffs (2)		15	0						
	Skiffs (8)		16	0						
	Skiffs (11)		18	0						
	Skiffs (17)		20	0						
	Skiff (1)		22	0						
	Skiffs (4)		24	0						

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[1] Secondhand.

employed in the Engineer Department at Large on June 30, 1911—Continued.

PITTSBURGH, PA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$204.00	$180.00	Good.	Lock 6, Monongahela River.	Operating and care of canals and other works of navigation, indefinite, as applied to Monongahela River.
		do	196.00	180.00	do	Lock 4, Monongahela River.	Do.
		do	184.00	145.00	do	Lock 3, Monongahela River.	Do.
		do	213.00	175.00	do	Lock 2, Monongahela River.	Do.
		do	166.00	166.00	do	At Locks Nos. 1 to 8, including Ohio River.	Operating and care of canals and other works of navigation, indefinitely, as applied to Ohio River.
		do	150.00	60.00	do	do	Do.
		do	80.00	10.00	Fair.	do	Do.
		do	205.00	40.00	Bad.	do	Do.
		do	204.00	75.00	Good.	do	Do.
		do	1,600.00	900.00	do	do	Improving Ohio River below Pittsburgh, Pa.; Dams Nos. 1 to 6, inclusive, and No. 8.
1906	Vanport, Pa.	do	80.00	40.00	Fair.	do	Do.
		do	160.00	160.00	Good.	do	Do.
1906	Coraopolis, Pa.	do	150.00	35.00	Bad.	do	Do.
1906	do	do	100.00	50.00	Fair.	do	Do.
		do	245.00	200.00	Good.	do	Do.
		do	245.00	125.00	Fair.	do	Do.
1907	Coraopolis, Pa.	do	215.00	70.00	do	Lock 2, Allegheny River.	Operating and care of canals and other works of navigation, indefinitely, as applied to Allegheny River.
1907	do	do	215.00	70.00	do	Lock 3, Allegheny River.	Do.
1907	Pittsburgh, Pa.	do	[1] 700.00	300.00	Good.	Lock 1, Allegheny River.	Dam at Herrs Island, Allegheny River near Pittsburgh, Pa.
1908-1910	do	do	48.00	[1] 530.00	7 bad, 25 fair, 11 good.	Monongahela, Allegheny, and Ohio Rivers in the Pittsburgh district.	Improving Monongahela River, Pa., Lock No. 5; operating and care of canals and other works of navigation, indefinitely; Monongahela River, Ohio River, Allegheny River, improving harbor at Pittsburgh, Pa.; improving Ohio River below Pittsburgh, Pa.
1905-1910	do	do	192.00				
1905-1910	do	do	297.00				
1906-1911	do	do	510.00				
1907	do	do	33.00				
1907-1909	do	do	160.00				

TABLE VI.—*Statement of floating plant owned by the United States and*

PORTLAND, ME.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Norka	Launch (motor)	22.00	62 0	14 0	6 1	1905	New York City

PORTLAND (OREG.), FIRST DISTRICT.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Oregon	Hydraulic pipe-line dredge.	533.00	120 0	36 0	11 0	1908	Portland, Oreg.
Cascade[1]	Combination suction and dipper dredge.	90.00	60 0	30 0	5 0	1906	Cascade Locks, Oreg.
Wallowa	Self-propelling dipper dredge.	175.00	125 0	25 6	5 0	1904	Riparia, Wash.
Umatilla	Self-propelling rake dredge.	300.00	159 9	34 4	5 1	1908	Celilo, Oreg.
Arago	Steam tug	130.00	89 10	18 0	9 0	1905	Portland, Oreg.
Jennie	Gasoline launch	5.00	30 0	8 0	3 2	1907	do
Margaretta	Naphtha launch	3.00	21 0	5 6	2 6	1892	Tacoma, Wash.
No. 1	84-ton derrick scow	84.00	70 0	30 0	4 0	1910	North Bend, Oreg.
No. 1	200-ton dredge scow	60.00	62 0	28 0	5 6	[2] 1890	Coquille, Oreg.
No. 2	84-ton dredge scow	84.00	70 0	30 0	3 8	1900	Tillamook, Oreg.
No. 1	100-ton coal scow	60.00	60 0	24 0	5 0	1908	Beverly, Wash.
No. 8	270-ton stone barge	130.00	89 1	27 1	6 5	1889	Yaquina Bay, Oreg.
No. 9	do	130.00	89 1	27 1	6 5	1889	do
No. 10	do	130.00	89 6	27 0	6 5	1889	do

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[1] Shown on previous reports as No. 3.

employed in the Engineer Department at Large on June 30, 1911—Continued.

PORTLAND, ME.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1905	New York City.	Wood.	$12,500.00	$7,000.00	Good..	Coast of Maine and New Hampshire.	River and harbor improvements.

PORTLAND (OREG.), FIRST DISTRICT.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
.....	....	Wood.	$98,502.56	$80,000.00	Good..	Coos Bay and Coquille River.	River and harbor works in Portland, Oreg., first district, and Seattle, western district.
.....	....	...do...	6,056.00	4,000.00	...do...	Cascade Locks, Oreg.	Operating and care of canals, and other works of navigation, indefinite; canal at Cascades, Columbia River, Oreg.
.....	....	...do...	32,755.00	21,000.00	Fair...	Snake River......	Improving upper Columbia and Snake Rivers, Oreg., Wash., and Idaho.
.....	....	...do...	55,245.00	50,000.00	Good..	Columbia River above Celilo Falls to mouth of Snake River.	Improving Columbia River and tributaries above Celilo Falls to mouth of Snake River, Oreg. and Wash.
.....	....	...do...	24,490.00	14,000.00	Fair...	Fort Stevens, Oreg.	Improving Tillamook Bay and Bar, Oreg.; Coquille River, Oreg., from Coquille to mouth; entrance to Coos Bay and Harbor, Oreg.; Yaquina Bay, Oreg.; Siuslaw River, Oreg.
.....	....	...do...	1,550.00	1,000.00	Good..	Tillamook, Oreg..	Improving Tillamook Bay and Bar, Oreg.
1892	Tacoma, Wash..	...do...	900.00	40.00	Unserviceable.	Out of commission.	Improving entrance to Coos Bay and Harbor, Oreg.
1910	North Bend, Oreg.	...do...	2,200.00	2,200.00	Good..	Coquille River...	Improving Coquille River, Oreg., from Coquille to mouth.
.....	....	...do...	3,000.00	25.00	(²)....	Out of commission.	Do.
1900	Tillamook, Oreg.	...do...	2,700.00	300.00	Poor..	Tillamook, Oreg..	Improving Tillamook Bay and Bar, Oreg.
1910	Kennewick, Wash.	...do...	Unknown.	100.00	...do...	Columbia River above Celilo Falls to mouth of Snake River.	Improving Columbia River and tributaries above Celilo Falls to mouth of Snake River, Oreg. and Wash.
.....	....	...do...	2,341.00	100.00	...do...	Mouth of Siuslaw River, Oreg.	Improving entrance to Coos Bay and Harbor, Oreg.
.....	....	...do...	2,341.00	100.00	...do...	.....do.........	Do.
.....	....	...do...	2,341.00	100.00	...do...	.....do.........	Do.

[1] Rebuilt in 1903.

[2] Unserviceable.

TABLE VI.—*Statement of floating plant owned by the United States and*

PORTLAND (OREG.), FIRST DISTRICT—Continued.

Name or number.	Class and description.	Dis-placement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
No. 1	57-ton wood scow	50.00	60 0	24 0	4 0	1900	Portland, Oreg
No. 2	10-ton wood scow	18.00	38 0	12 0	3 0	1905	Tillamook, Oreg
No. 1	7-ton flat boat	10.00	30 0	10 0	2 9	1903	do

PORTLAND (OREG.), SECOND DISTRICT.

Name or number.	Class and description.	Dis-placement.	Length.	Beam.	Depth.	When.	Where.
Chinook [2]	Seagoing hopper dredge	7,000.00	445 0	49 0	34 0	1892	Belfast, Ireland [3]
Clatsop	do	1,360.00	168 0	38 0	23 0	1908	Newport News, Va
Cowlitz [5]	Combination hydraulic pipe line and bucket dredge.	162.00	78 0	34 0	5 6	1895 1911	Portland, Oreg.[6] Remodeled at Portland, Oreg.
Champoeg	Dipper dredge	165.00	80 0	30 0	5 0	1904	Portland, Oreg
Mathloma	Combination snag boat and bucket dredge.	177.00	140 0	34 0	4 0	1896	do.[6]
Mendell, G. H	Screw tugboat	94.00	80 0	18 0	8 4	1889	do
Dolly	Gasoline launch	2.50	25 0	6 0	3 3	1899	Morris Heights, N. Y.
Eureka [7]	do	3.00	25 0	8 3	3 3	1906	Wilmington, Del
Mohawk	do	5.50	30 6	8 0	3 9	1910	Portland, Oreg
Papoose [7]	Steam launch	6.00	30 3	7 10	4 0	1899	Morris Heights, N. Y.
Salem	Gasoline launch	6.50	34 0	8 6	3 6	1910	Portland, Oreg
Vigilant	do	22.00	63 11	11 6	7 8	1906	Eagle Harbor, Wash.
No. 1	Quarter boat	120.00	90 0	26 0	4 0	1902	Portland, Oreg
A	500-ton model barge	350.00	120 0	32 0	8 0	1902	do

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[1] Unserviciable.
[2] Formerly U. S. transport Grant.
[3] Remodeled at San Francisco, Cal., 1903; remodeled at Portland, Oreg., 1910.

employed in the Engineer Department at Large on June 30, 1911—Continued.

PORTLAND (OREG.), FIRST DISTRICT—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1900	Portland, Oreg.	Wood.	$750.00	$25.00	(1)	Out of commission.	Improving Tillamook Bay and Bar, Oreg.
1906	Tillamook, Oreg.	...do...	50.00	25.00	Fair...	Tillamook, Oreg.	Improving entrance to Coos Bay and Harbor, Oreg.
......	....	...do...	250.00	40.00	Poor..	.....do...........	Improving Tillamook Bay and Bar, Oreg.

PORTLAND (OREG.), SECOND DISTRICT.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
(4)	....	Steel..	Unknown.	$450,000.00	Good..	Mouth of Columbia River, Oreg. and Wash.	Improving mouth of Columbia River, Oreg. and Wash.
1908	Newport News, Va.	...do...	$234,500.00	220,000.00	...do...	Lower Columbia River, Oreg. and Wash.	Improving Columbia and Lower Willamette Rivers below Portland, Oreg.
1903	Portland, Oreg..	Wood.	2,500.00	4,000.00	...do...	ClatskanieRiver, Oreg., Cowlitz River, Wash., Lewis River, Wash.	Improving Clatskanie River, Oreg.
1904	.....do..........	...do...	19,200.00	12,000.00	...do...	Willamette River above Portland, Oreg.	Improving Willamette and Yamhill Rivers, Oreg.
1896	.....do..........	...do...	19,560.00	13,500.00	...do...	.....do...........	Do.
1889	.....do..........	...do...	20,000.00	2,000.00	Poor..	Out of commission.	Improving mouth of Columbia River, Orog. and Wash.
1900	New York; N. Y.	...do...	1,273.25	250.00	...do...	Willamette River below Portland, Oreg.	Improving Columbia and Lower Willamette Rivers below Portland, Oreg.
1908	Wilmington, Del.	...do...	Unknown.	300.00	...do...	Lower Columbia River, Oreg. and Wash.	Do.
1910	Portland, Oreg..	...do...	1,800.00	1,500.00	Good..	Mouth of Columbia River, Oreg. and Wash.	Improving mouth of Columbia River, Oreg. and Wash.
(4)	....	...do...	Unknown.	250.00	Poor..	Out of commission.	Do.
1910	Portland, Oreg..	...do...	2,200.00	2,000.00	Good..	Willamette River above Portland, Oreg.	Improving Willamette and Yamhill Rivers, Oreg.
1908	Eagle Harbor, Wash.	...do...	9,500.00	6,500.00	...do...	Lower Columbia River, Oreg. and Wash.	Improving mouth of Columbia Rivor, Oreg. and Wash. Improving Columbia and Lower Willametto Rivers below Portland, Oreg.
1902	Portland, Oreg..	...do...	3,050.00	1,200.00	Fair...	.....do...........	Do.
1902	.....do..........	...do...	6,950.00	4,500.00	Good..	Mouth of Columbia River, Oreg. and Wash.	Improving mouth of Columbia River, Oreg. and Wash.

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[4] Unknown.
[5] Formerly No. 2 dipper dredge.
[6] Rebuilt at Portland, Oreg., 1906.
[7] Formerly without name or number.

Table VI.—*Statement of floating plant owned by the United States and*

PORTLAND (OREG.), SECOND DISTRICT—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
B	500-ton model barge	350.00	120	0	32	0	8	0	1902	Portland, Oreg.
No. 1	200-ton scow barge	100.00	90	0	26	0	4	0	1902	do.
No. 2[1]	10-ton scow barge	15.00	32	0	14	0	2	6	1903	do.

ROCK ISLAND, ILL.

Name or number.	Class and description.	Displacement.	Length.		Beam.		Depth.		When.	Where.
Geyser	Hydraulic pipe-line dredge.	100.00	100	0	20	0	4	0	1893	Keokuk, Iowa
Hecla	do.	163.00	120	0	26	0	5	0	1901	Fountain City, Wis.
Pelee	do.	250.00	119	0	30	0	5	0	1909	Stillwater, Minn.
Vesuvius	do.	215.00	120	0	30	0	5	0	1909	Fountain City, Wis.
Etna	do.	266.00	130	0	28	0	5	0	1909	Keokuk, Iowa
Ajax	Dipper dredge	115.00	70	0	26	0	6	0	1876	Quincy, Ill.
Apache	do.	240.00	80	0	30	0	8	0	1895	Lyons, Iowa
Phoenix	do.	158.00	80	0	30	0	8	0	1885	Metropolis, Ill.
Vulcan	do.	219.00	80	0	30	0	8	0	1883	Davenport, Iowa
David Tipton	Snag boat	235.00	160	0	33	0	5	0	1900	Jeffersonville, Ind.
Ellen	Towboat	200.00	124	0	26	6	4	5	1907	La Crosse, Wis.
Coal Bluff	do.	175.00	128	0	25	0	4	6	1878	Ohio River
Elinor	do.	213.00	125	0	25	0	4	0	1905	Jeffersonville, Ind.
Alert	do.	135.00	105	0	19	6	3	10	1874	Stillwater, Minn.
Fury	do.	150.00	113	0	22	0	3	10	1881	Dubuque, Iowa
Henry Bosse	do.	100.00	100	0	19	6	3	10	1881	do.
Grace	do.	38.00	79	0	17	0	3	3	1904	Keokuk, Iowa
Ruth	do.	35.00	75	0	17	0	3	3	1895	do.
Mac	do.	35.00	73	0	16	0	3	3	1891	Rock Island, Ill.
Lucia	do.	25.00	68	0	12	8	3	0	1885	Keokuk, Iowa
Ada	do.	(2)	68	0	11	0	3	0	1889	do.
Elsie	do.	40.00	63	0	13	0	3	0	1889	Jeffersonville, Ind.
Emily	do.	25.00	67	0	12	0	3	0	1889	Keokuk, Iowa
uise	do.	39.00	61	0	12	0	3	0	1883	do.

[1] Formerly without name or number.

employed in the Engineer Department at Large on June 30, 1911—Continued.

PORTLAND (OREG.), SECOND DISTRICT—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1902	Portland, Oreg.	Wood.	$6,950.00	$1,500.00	Poor	Lower Columbia River, Oreg. and Wash.	Improving Columbia and lower Willamette Rivers below Portland, Oreg.
1902	do	do	2,975.00	800.00	Fair	do	Do.
		do	250.00	75.00	Poor	do	Do.

ROCK ISLAND, ILL.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$5,450.00	$9,800.00	Good	Between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		do	27,380.00	10,400.00	do	do	Do.
		do	33,600.00	21,500.00	do	do	Do.
		do	33,375.00	22,150.00	do	do	Do.
		do	29,415.00	19,280.00	do	do	Do.
1876	Keokuk, Iowa	do	11,300.00	6,100.00	do	do	Operating and care Des Moines Rapids Canal.
		do	15,255.34	6,000.00	Fair	do	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
1885	Metropolis, Ill.	do	19,524.00	14,500.00	Good	do	Do.
1883	Davenport, Iowa	do	19,450.00	8,500.00	Fair	do	Do.
1900	Jeffersonville, Ind.	do	33,286.00	15,200.00	do	Upper Mississippi River and tributaries.	Operating snag and dredge boats on upper Mississippi, Illinois, and Minnesota Rivers.
1911	La Crosse Wis.	do	12,000.00	12,000.00	Good	Between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
1881	Ohio River	do	8,000.00	6,700.00	Bad	do	Do.
1905	Jeffersonville, Ind.	do	17,600.00	6,200.00	Good	do	Do.
1881	Stillwater, Minn.	do	6,000.00	6,100.00	Fair	do	Do.
1881	Dubuque, Iowa	do	11,976.00	4,500.00	do	do	Do.
1881	do	do	11,976.00	4,500.00	Bad	do	Do.
		do	8,555.00	3,050.00	Good	do	Operating and care Des Moines Rapids Canal.
		do	5,946.00	5,100.00	Fair	do	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
1893	Rock Island, Ill.	do	2,500.00	3,525.00	do	do	Do.
		do	4,000.00	1,700.00	Bad	do	Do.
		do	4,000.00	1,530.00	Good	do	Do.
1889	Jeffersonville, Ind.	Steel	5,110.00	2,530.00	do	do	Do.
		Wood.	4,034.00	4,250.00	do	do	Do.
		Steel	3,538.00	1,950.00	do	do	Do.

[3] Draft forward and aft 26 inches, length on water line 64½ feet.

TABLE VI.—*Statement of floating plant owned by the United States and*

ROCK ISLAND, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
Marion	Towboat	54.00	80 0	18 0	3 0	1895	Keokuk, Iowa
Leona	Towboat (gasoline)	10.00	46 0	12 0	3 0	1907	Blossomburg, Ill
Mary Mc	do	12.00	43 0	8 0	4 0	1900	La Crosse, Wis
Myra	Launch (gasoline)	10.00	40 0	7 4	3 6	1902	do
Vamos	do	5.00	31 0	7 0	2 2	1908	Red Wing, Minn
Rock Island Rapids	do	4.00	22 0	4 0	2 0	1909	Newport, Ky
Madge	do	4.00	25 0	6 0	3 0	1904	St. Joseph, Mich
Dolphin	do	4.00	20 0	6 0	2 6	1910	Salem, Ohio
Wasp	Motor skiff		22 0	5 0	0 8	1908	Keokuk, Iowa
Wren	do		26 0	5 3	1 3	1908	do
Jolly	do		26 0	5 3	1 3	1909	do
Folly	do		26 0	5 3	1 3	1909	do
Molly	do		26 0	5 3	1 3	1909	do
Polly	do		26 0	5 3	1 3	1909	do
Holly	do		26 0	5 3	1 3	1909	do
Dolly	do		26 0	5 3	1 3	1909	do
Lally	do		26 0	5 3	1 3	1910	do
Lark	do		26 0	5 3	1 3	1907	do
Linnet	do		26 0	5 3	1 3	1907	do
Swallow	do		20 0	5 10	1 7	1908	do
Sparrow	do		20 0	5 10	1 7	1908	do
Swift	do		20 0	5 10	1 7	1908	do
Hornet	do		26 0	5 3	1 3	1909	do
Cobra	do		26 0	5 3	1 3	1909	do
Davy	do		24 8	5 3	1 8½	1909	Fountain City, Wis
Fox	do		26 0	5 3	1 3	1910	Keokuk, Iowa
Shad	do		26 0	5 3	1 3	1910	do
Alberita	do		26 0	5 3	1 3	1910	do
Trout	do		26 0	5 3	1 3	1910	do
Bass	do		26 0	5 3	1 3	1910	do
Yawl	do		25 6	6 5	2 6		
Gar	do		26 0	5 3	1 3	1910	Keokuk, Iowa
Snipe	do		20 0	6 4	2 0	1908	do
Loon	do		26 0	6 0	1 6	1908	do
Beetle	do		26 0	5 1	1 5	1909	do
Firefly	d0		26 0	5 1	1 5	1909	do
Gnat	do		26 0	5 1	1 5	1909	do
Locust	do		26 0	5 1	1 5	1909	do
Mosquito	do		26 0	5 1	1 5	1909	do
Moth	do		26 0	5 1	1 5	1909	do
Viper	do		28 0	4 6	2 6	1909	do
Bittern	do		20 0	5 9	1 0	1911	Rock Falls, Ill
Curlew	do		20 0	5 9	1 0	1911	do
Plover	do		20 0	5 9	1 0	1911	do
No. 34	Steam-drill boat		66 0	18 0	4 0	1881	Davenport, Iowa
No. 6	do		80 0	20 0	4 0	1893	Keokuk, Iowa
No. 103	do		81 0	18 0	4 0	1889	do

employed in the Engineer Department at Large on June 30, 1911—Continued.

ROCK ISLAND, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$6,500.00	$5,000.00	Fair...	Illinois & Mississippi Canal.	Illinois & Mississippi Canal.
1910	Rock Island, Ill.	...do...	1,000.00	840.00	Good..	.....do..........	Do.
1903	.....do..........	...do...	1,750.00	1,500.00	Fair...	.....do..........	Do.
1903	La Crosse, Wis..	...do...	1,500.00	900.00	Good..	Between mouth of Missouri River and Minneapolis, Minn.	Operating and care Des Moines Rapids Canal.
1908	Red Wing, Minn	...do...	1,975.00	1,150.00	...do...	.....do..........	Do.
1909	Newport, Ky...	...do...	435.00	310.00	...do...	.....do..........	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
1904	St. Joseph, Mich.	...do...	1,000.00	390.00	...do...	.....do..........	Operating and care Des Moines Rapids Canal.
1910	Salem, Ohio.....	...do...	1,460.00	1,460.00	...do...	.....do..........	Do.
......	....	...do...	350.00	210.00	...do...	.....do..........	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
......	....	...do...	171.00	130.00	Fair...	.....do..........	Do.
......	....	...do...	240.00	160.00	...do...	.....do..........	Do.
......	....	...do...	244.00	170.00	Good..	.....do..........	Do.
......	....	...do...	241.00	170.00	...do...	.....do..........	Do.
......	....	...do...	301.00	210.00	...do...	.....do..........	Do.
......	....	...do...	245.00	160.00	Fair...	.....do..........	Do.
......	....	...do...	262.00	170.00	...do...	.....do..........	Do.
......	....	...do...	262.00	225.00	Good..	.....do..........	Do.
......	....	...do...	262.00	120.00	Fair...	.....do..........	Do.
......	....	...do...	262.00	120.00	...do...	.....do..........	Do.
......	....	...do...	200.00	130.00	Good..	.....do..........	Do.
......	....	...do...	200.00	130.00	...do...	.....do..........	Do.
......	....	...do...	200.00	105.00	...do...	.....do..........	Do.
......	....	...do...	498.00	390.00	...do...	.....do..........	Do.
......	....	...do...	365.00	280.00	...do...	.....do..........	Do.
......	....	...do...	285.00	185.00	...do...	.....do..........	Do.
......	....	...do...	303.27	300.00	...do...	.....do..........	Do.
......	....	...do...	288.99	275.00	...do...	.....do..........	Do.
......	....	...do...	214.17	200.00	...do...	.....do..........	Do.
......	....	...do...	363.04	350.00	...do...	.....do..........	Do.
......	....	...do...	310.09	300.00	...do...	.....do..........	Do.
......	....	...do...	....	280.00	Fair...	.....do..........	Do.
......	....	...do...	260.54	250.00	Good..	.....do..........	Do.
......	....	...do...	200.00	250.00	Fair...	Illinois & Mississippi Canal.	Illinois & Mississippi Canal.
......	....	...do...	200.00	250.00	...do...	.....do..........	Do.
......	....	...do...	300.00	250.00	...do...	.....do..........	Do.
......	....	...do...	300.00	250.00	...do...	.....do..........	Do.
......	....	...do...	300.00	250.00	...do...	.....do..........	Do.
......	....	...do...	300.00	250.00	...do...	.....do..........	Do.
......	....	...do...	300.00	250.00	...do...	.....do..........	Do.
......	....	...do...	300.00	250.00	...do...	.....do..........	Do.
......	....	...do...	800.00	1,400.00	Good..	.....do..........	Do.
......	....	...do...	333.00	333.00	...do...	.....do..........	Do.
......	....	...do...	333.00	333.00	...do...	.....do..........	Do.
......	....	...do...	333.00	333.00	...do...	.....do..........	Do.
1881	Davenport, Iowa	...do...	1,200.00	390.00	Bad...	Between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis
......	....	...do...	3,420.00	4,208.00	Fair...	.....do..........	Do.
......	....	...do...	2,216.00	3,000.00	Bad...	.....do..........	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ROCK ISLAND, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	Ft.in.	Ft.in	Ft.in.		
No. 33	Pile driver		66 0	18 0	4 0	1893	Keokuk, Iowa
No. 104[1]	do		65 0	18 0	3 0	1889	do
No. 319	Derrick boat		70 0	26 0	4 0	1909	Milan, Ill.
No. 13	90-ton dump boat	45.00	73 0	18 0	5 6	1909 1910	do
No. 14	do	45.00	73 0	18 0	5 6	1909 1910	do
No. 15	do	45.00	73 0	18 0	5 6	1909 1910	do
No. 16	do	45.00	73 0	18 0	5 6	1909 1910	do
A	do	45.00	73 0	18 0	5 0	1903 1904	Keokuk, Iowa
C	do	45.00	73 0	18 0	5 0	1903 1904	do
D	do	45.00	73 0	18 0	5 0	1903 1904	do
No. 225	Building boat		120 0	20 0	4 0	1904	Fountain City, Wis
No. 208	do		160 0	26 0	4 0	1904	Keokuk, Iowa
No. 209	do		140 0	22 0	4 0	1903	St. Paul, Minn
No. 333	do		160 0	26 0	4 6	1909	South Stillwater, Minn.
No. 338	do		120 0	20 0	4 0	1909	Fountain City, Wis.
No. 224	Grasshopper		40 0	38 0	3 6	1904	Grafton, Ill.
No. 336	do		36 0	16 0	2 0	1909	Fountain City, Wis.
No. 337	do		36 0	16 0	2 0	1909	do
No. 339	do		40 0	30 0	3 0	1909	Dubuque, Iowa
No. 435	do		36 0	16 0	2 0	1910 1911	Fountain City, Wis.
No. 30	Magazine boat		20 0	10 0	2 3	1910	Milan, Ill.
No. 106	do		20 0	7 0	2 0	1893	Keokuk, Iowa
No. 28	Loading boat		20 0	6 0	2 0	1893	do
No. 107	do		20 0	6 0	2 0	1889	do
No. 205	Sounding boat		50 0	18 0	3 0	1902	do
No. 230	Store boat		80 0	20 0	4 0	1904	Fountain City, Wis.
No. 234	do		80 0	18 0	3 0	1908	Dubuque, Iowa
No. 334	do		80 0	18 0	5 0	1908	Stillwater, Minn.
No. 335	do		100 0	20 0	3 6	1909	Fountain City, Wis.
No. 20	Office boat		64 0	18 0	3 0	1897	do
No. 119	do		40 0	14 0	2 0	1892	La Crosse, Wis
No. 120	do		40 0	14 0	2 0	1892	do
No. 48	do		40 0	12 0	2 0	1894	Keokuk, Iowa
No. 51	do		40 0	12 0	2 0	1894	do
No. 12	do		32 0	14 0	3 2	1895	do
No. 41	do		32 0	14 0	3 2	1895	do
No. 66	do		32 0	12 0	2 0	1893	do
No. 68	do		32 0	12 0	2 0	1893	do
No. 81	do		32 0	12 0	2 0	1893	do
No. 85	do		32 0	12 0	2 0	1893	do
No. 86	do		32 0	12 0	2 0	1893	do
No. 90	do		32 0	12 0	2 0	1893	do
No. 67	do		66 0	18 0	3 6	1893	La Crosse, Wis
No. 204	do		60 0	18 0	4 0	1902	Fountain City, Wis.
No. 69	do		50 0	16 0	3 0	1893	La Crosse, Wis
No. 411	do		75 0	20 0	3 6	1910	Fountain City, Wis.
No. 413	do		36 0	12 0	2 0	1910 1911	Dubuque, Iowa
No. 431	do		36 0	12 0	3 0	1910	do

[1] No machinery on this boat.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ROCK ISLAND, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$1,400.00	$390.00	Good..	Between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		...do...	2,634.00	675.00	Bad...	.....do...........	Do.
		...do...	3,045.24	3,000.00	Good..	.....do...........	Do.
		...do...	1,616.28	1,540.00	...do...	.....do...........	Do.
		...do...	2,008.52	1,540.00	...do...	.....do...........	Do.
		...do...	2,349.27	1,880.00	...do...	.....do...........	Do.
		...do...	2,430.41	1,880.00	...do...	.....do...........	Do.
		...do...	1,680.00	1,100.00	Bad...	Upper Mississippi River between mouth of Missouri River and Minneapolis, Minn.	Operating and care Des Moines Rapids Canal.
		...do...	1,643.46	750.00	...do...	.....do...........	Do.
		...do...	1,680.61	950.00	...do...	.....do...........	Do.
		...do...	1,500.00	640.00	Fair...	.....do...........	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		...do...	4,390.00	2,140.00	Good..	.....do...........	Do.
		...do...	2,140.00	1,200.00	...do...	.....do...........	Do.
		...do...	4,010.00	2,550.00	...do...	.....do...........	Do.
		...do...	1,663.00	1,070.00	...do...	.....do...........	Do.
		...do...	402.00	360.00	Fair...	.....do...........	Do.
		...do...	438.14	280.00	Good..	.....do...........	Do.
		...do...	442.58	280.00	...do...	.....do...........	Do.
		...do...	579.77	360.00	...do...	.....do...........	Do.
		...do...	300.00	300.00	...do...	.....do...........	Do.
		...do...	224.74	180.00	...do...	.....do...........	Do.
		...do...	125.00	60.00	Fair...	.....do...........	Do.
		...do...	....	75.00	Good..	.....do...........	Do.
		...do...	130.00	75.00	...do...	.....do...........	Do.
		...do...	580.00	108.00	Fair...	.....do...........	Do.
		...do...	701.04	360.00	Good..	.....do...........	Do.
		...do...	1,344.26	720.00	...do...	.....do...........	Do.
		...do...	1,315.50	720.00	...do...	.....do...........	Do.
		...do...	2,189.40	1,520.00	...do...	.....do...........	Do.
		...do...	1,451.00	450.00	...do...	.....do...........	Do.
1892	La Crosse, Wis..	...do...	195.00	600.00	...do...	.....do...........	Do.
1892	....do........	...do...	195.00	400.00	Fair...	.....do...........	Do.
		...do...	281.72	250.00	Good..	.....do...........	Do.
		...do...	287.00	250.00	...do...	.....do...........	Do.
		...do...	195.00	90.00	Bad...	.....do...........	Do.
		...do...	232.43	160.00	Good..	.....do...........	Do.
		...do...	201.00	210.82	Fair...	.....do...........	Do.
		...do...	201.00	160.00	Good..	.....do...........	Do.
		...do...	201.00	240.00	...do...	.....do...........	Do.
		...do...	201.00	160.00	...do...	.....do...........	Do.
		...do...	201.00	240.00	...do...	.....do...........	Do.
		...do...	201.00	50.00	Bad...	.....do...........	Do.
		...do...	1,727.34	1,550.00	Fair...	.....do...........	Do.
		...do...	1,420.00	1,100.00	Good..	.....do...........	Do.
		...do...	606.00	200.00	Fair...	.....do...........	Do.
		...do...	2,624.06	2,624.06	Good..	.....do...........	Do.
		...do...	471.18	470.00	...do...	.....do...........	Do.
		...do...	614.12	600.00	...do...	.....do...........	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ROCK ISLAND, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	Ft.	in.	Ft.	in.	Ft.	in.		
Rambler	House-boat		48	0	15	0	3	0	1902	Clinton, Iowa
No. 11	Quarter boat		75	0	20	0	3	0	1894	Keokuk, Iowa
No. 47	do		75	0	20	0	3	0	1894	do
No. 71	do		75	0	20	0	3	0	1894	do
No. 75	do		75	0	20	0	3	6	1882	Davenport, Iowa
No. 118	do		70	0	20	0	3	0	1891	Keokuk, Iowa
No. 202	do		70	0	20	0	3	0	1895	Fountain City, Wis.
No. 301	do		75	0	20	0	4	0	1909	Keokuk, Iowa
No. 17	do		70	0	24	0	3	0	1893	Stillwater, Minn.
No. 262	do		66	0	22	0	3	0	1909	Fountain City, Wis.
No. 183	do		100	0	20	0	3	0	1895	Keokuk, Iowa
No. 52	do		58	0	18	0	3	6	1895	Fountain City, Wis.
No. 94	do		65	0	18	0	3	0	(1)	Unknown
No. 184	do		60	0	18	0	3	0	1894	Quincy, Ill.
No. 121	do		52	0	16	0	2	6	1892	Rock Island, Ill.
No. 122	do		52	0	16	0	2	6	1892	do
No. 123	do		52	0	16	0	2	6	1892	do
No. 124	do		52	0	16	0	2	6	1892	do
No. 92	do		81	0	16	0	3	0	1881	Davenport, Iowa
No. 237	do		68	0	22	0	3	0	1909	South Stillwater, Minn.
No. 91	do		50	0	12	0	3	0	1884	Davenport, Iowa
No. 65	do		40	0	16	0	2	0	1893	La Crosse, Wis.
No. 45	do		74	0	16	0	3	0	1894	Keokuk, Iowa
Sangamon (No. 231)	do		100	0	20	0	4	3	1904	Kampsville, Ill
La Salle (No. 232)	do		100	0	20	0	4	3	1904	do
No. 342[1]	do		80	0	20	0	3	0	1910	Keokuk, Iowa
No. 343	do		75	0	20	0	3	0	1910	Milan, Illinois
No. 346	do		80	0	20	0	3	0	1910	Keokuk, Iowa
No. 347	do		80	0	20	0	3	0	1910	do
No. 348	do		80	0	20	0	3	0	1910	do
No. 412	do		82	0	20	0	3	0	1910 1911	Dubuque, Iowa
No. 14[1]	do		70	0	16	0	4	0		
No. 342	do		80	0	20	0	3	0	1911	Keokuk, Iowa
No. 1	80-ton barge	23.00	68	0	16	0	3	8	1908	Rock Falls, Ill
No. 2	do	23.00	68	0	16	0	3	8	1908	do
No. 3	do	25.00	70	0	16	0	4	0	1908	do
No. 4	do	25.00	70	0	16	0	4	0	1908	do
No. 5	do	25.00	70	0	16	0	4	0	1908	do
No. 6	do	25.00	70	0	16	0	4	0	1908	do
No. 7	do	25.00	70	0	16	0	4	0	1908	do
No. 8	do	25.00	70	0	16	0	4	0	1908	do
No. 9	do	25.00	70	0	16	0	4	0	1908	do
No. 10	do	25.00	70	0	16	0	4	0	1908	do
No. 11	do	25.00	70	0	16	0	4	0	1908	do
No. 12	50-ton barge	15.00	44	0	20	0	3	0	1908	do
No. 13	65-ton barge	25.00	70	0	16	0	4	0		
No. 15	3-ton scow	2.00	26	0	5	4	1	6	1908	Rock Falls, Ill
No. 16	do	2.00	26	0	5	4	1	6	1908	do
No. 17	80-ton barge	25.00	70	0	16	0	4	0	1909	Milan, Ill
No. 18	do	25.00	70	0	16	0	4	0	1909	do
No. 19	do	25.00	70	0	16	0	4	0	1909	do
No. 20	do	25.00	70	0	16	0	4	0	1909	do
No. 21	do	25.00	70	0	16	0	4	0	1909	do
No. 22	do	25.00	70	0	16	0	4	0	1909	do
No. 23	do	25.00	70	0	16	0	4	0	1909	do
No. 24	do	25.00	70	0	16	0	4	0	1909	do

[1] Transferred from Rock Island district.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ROCK ISLAND, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1907	Rock Island, Ill.	Wood.	$1,500.00	$1,000.00	Poor.	Illinois & Mississippi Canal.	Illinois & Mississippi Canal.
		do.	1,647.64	960.00	Good.	Upper Mississippi River between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		do.	1,561.47	800.00	do.	do.	Do.
		do.	1,157.72	1,200.00	do.	do.	Do.
1882	Davenport, Iowa	do.	700.00	1,185.00	Fair.	do.	Do.
		do.	1,414.06	1,250.00	Good.	do.	Do.
		do.	1,257.63	800.00	Fair.	do.	Do.
		do.	3,027.13	2,025.00	Good.	do.	Do.
		do.	1,138.19	1,627.00	do.	do.	Do.
		do.	2,492.00	1,600.00	do.	do.	Do.
		do.	2,320.00	1,700.00	do.	do.	Do.
		do.	974.00	900.00	Fair.	do.	Do.
1884	St. Paul, Minn.	do.	250.00	600.00	do.	do.	Do.
		do.	870.00	1,040.00	Good.	do.	Do.
1892	Rock Island, Ill.	do.	430.00	600.00	do.	do.	Do.
1892	do.	do.	430.00	600.00	do.	do.	Do.
1892	do.	do.	430.00	360.00	Fair.	do.	Do.
1892	do.	do.	430.00	380.00	Good.	do.	Do.
		do.	384.47	300.00	Fair.	do.	Do.
		do.	2,931.12	2,400.00	do.	do.	Do.
1884	Davenport, Iowa	do.	452.00	570.00	do.	do.	Do.
		do.	415.00	300.00	Good.	do.	Do.
		do.	657.00	340.00	do.	do.	Do.
		do.	2,970.00	1,600.00	do.	do.	Do.
		do.	2,365.00	850.00	Fair.	do.	Do.
		do.	2,756.99	2,750.00	Good.	do.	Do.
		do.	2,170.28	2,170.00	do.	do.	Do.
		do.	3,204.43	3,200.00	do.	do.	Do.
		do.	2,641.77	2,640.00	do.	do.	Do.
		do.	2,501.51	2,500.00	do.	do.	Do.
		do.	1,753.28	1,750.00	do.	do.	Do.
		do.	Not known.	200.00	Poor.	Illinois & Mississippi Canal.	Illinois & Mississippi Canal.
		do.	3,381.62	3,381.62	Good.	Upper Mississippi River between mouth of Missouri River and Minneapolis, Minn.	Des Moines Rapids Canal.
		do.	550.00	280.00	Poor.	Illinois & Mississippi Canal.	Illinois & Mississippi Canal.
		do.	550.00	280.00	do.	do.	Do.
		do.	550.00	280.00	do.	do.	Do.
		do.	550.00	280.00	do.	do.	Do.
		do.	550.00	300.00	Fair.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
		do.	550.00	300.00	do.	do.	Do.
1908	Colona, Ill.	do.	200.00	None.	Bad.	do.	Do.
		do.	25.00	10.00	Poor.	do.	Do.
		do.	25.00	10.00	do.	do.	Do.
		do.	838.44	670.00	Good.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.
		do.	838.44	670.00	do.	do.	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ROCK ISLAND, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
No. 53	150-ton barge	47.00	104 0	24 0	5 0	1893	Keokuk, Iowa
No. 54	do	47.00	104 0	24 0	5 0	1893	do
No. 4	do	50.00	110 0	24 0	4 6	1894	do
No. 7	do	50.00	110 0	24 0	4 6	1894	do
No. 70	do	50.00	110 0	24 0	4 6	1894	do
No. 153	do	50.00	110 0	24 0	4 6	1893	Quincy, Ill
No. 161	do	50.00	110 0	24 0	4 6	1893	do
No. 181	do	50.00	110 0	24 0	4 6	1894 1895	Keokuk, Iowa
No. 214	do	50.00	110 0	24 0	4 6	1903 1904	St. Paul, Minn
No. 215	do	50.00	110 0	24 0	4 6	1903 1904	do
No. 216	do	50.00	110 0	24 0	4 6	1903 1904	do
No. 217	do	50.00	110 0	24 0	4 6	1903 1904	do
No. 218	do	50.00	110 0	24 0	4 6	1903 1904	do
No. 219	do	50.00	110 0	24 0	4 6	1903 1904	do
No. 5	30-ton barge	11.00	50 0	12 0	3 0	1892	Stillwater, Minn
H	15-ton barge	7.00	50 0	10 0	2 0	1886	Keokuk, Iowa
K	35-ton barge	13.00	50 0	14 0	3 0	1891	do
L	150-ton barge	51.00	110 0	24 0	5 0	1905	do
G	10-ton barge	6.00	40 0	10 0	2 0	1882	do
No. 82	70-ton barge	28.00	76 0	18 0	4 0	1901	do
No. 238	50-ton barge	18.00	68 0	16 0	4 4	1909	South Stillwater, Minn.
No. 239	do	18.00	68 0	16 0	4 4	1909	do
No. 263	do	18.00	66 0	16 0	4 4	1909	Fountain City, Wis.
No. 264	do	18.00	66 0	16 0	4 4	1909	do
No. 147	100-ton barge	32.00	85 0	20 0	4 0	1903	Milan, Ill
No. 233	40-ton barge	14.00	52 0	15 6	3 6	(1)	Not known
No. 130	100-ton barge	36.00	100 0	20 0	4 0	1892	Stillwater, Minn
No. 132	do	36.00	100 0	20 0	4 0	1892	do
No. 133	do	36.00	100 0	20 0	4 0	1892	do
No. 134	do	36.00	100 0	20 0	4 0	1892	do
No. 152	do	36.00	100 0	20 0	4 0	1892	Rock Island, Ill
No. 168	do	36.00	100 0	20 0	4 0	1894	Stillwater, Minn
No. 169	do	36.00	100 0	20 0	4 0	1894	do
No. 170	do	36.00	100 0	20 0	4 0	1894	do
No. 172	do	36.00	100 0	20 0	4 0	1894	do
No. 173	do	36.00	100 0	20 0	4 0	1894	do
No. 186	do	36.00	100 0	20 0	4 0	1895	Rock Island, Ill
No. 187	do	36.00	100 0	20 0	4 0	1895	do
No. 188	do	36.00	100 0	20 0	4 0	1895	do
No. 192	do	36.00	100 0	20 0	4 0	1895	Fountain City, Wis.
No. 193	do	36.00	100 0	20 0	4 0	1895	do
No. 194	do	36.00	100 0	20 0	4 0	1895	do
No. 206	do	36.00	100 0	20 0	4 0	1903	Keokuk, Iowa
No. 207	do	36.00	100 0	20 0	4 0	1903	do
No. 210	do	36.00	100 0	20 0	4 0	1903	St. Paul, Minn
No. 211	do	36.00	100 0	20 0	4 0	1903	do
No. 212	do	36.00	100 0	20 0	4 0	1903	do
No. 213	do	36.00	100 0	20 0	4 0	1903	do
No. 220	do	36.00	100 0	20 0	4 0	1904	Milan, Ill

[1] Not known.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ROCK ISLAND, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$1,351.00	$370.00	Bad...	Upper Mississippi River between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		...do...	1,351.00	370.00	...do...	.....do	Do.
		...do...	1,460.12	800.00	Good..	.....do	Do.
		...do...	1,446.94	816.00	...do...	.....do	Do.
		...do...	1,451.11	100.00	Bad...	.....do	Do.
		...do...	1,600.00	720.00	Good..	.....do	Do.
		...do...	1,600.00	1,450.00	...do...	.....do	Do.
		...do...	1,351.50	150.00	Bad...	.....do	Do.
		...do...	1,361.09	750.00	Fair...	.....do	Do.
		...do...	1,361.09	750.00	...do...	.....do	Do.
		...do...	1,361.09	750.00	...do...	.....do	Do.
		...do...	1,361.09	750.00	...do...	.....do	Do.
		...do...	1,361.09	750.00	...do...	.....do	Do.
		...do...	1,361.09	750.00	...do...	.....do	Do.
1892	Stillwater, Minn.	...do...	275.00	115.00	Bad...	.....do	Do.
		...do...	231.00	25.00	...do...	.....do	Operating and care Des Moines Rapids Canal.
		...do...	397.00	170.00	Fair...	.....do	Do.
		...do...	1,258.00	500.00	...do...	.....do	Do.
		...do...	250.00	130.00	Good..	.....do	Do.
		...do...	132.00	75.00	...do...	.....do	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		...do...	758.04	500.00	...do...	.....do	Do.
		...do...	793.34	500.00	...do...	.....do	Do.
		...do...	701.62	440.00	...do...	.....do	Do.
		...do...	692.68	440.00	...do...	.....do	Do.
		...do...	806.00	400.00	Bad...	.....do	Do.
1907	Rock Island, Ill.	...do...	195.00	160.00	Fair...	.....do	Do.
		...do...	825.00	400.00	...do...	.....do	Do.
		...do...	825.00	400.00	...do...	.....do	Do.
		...do...	825.00	400.00	...do...	.....do	Do.
		...do...	825.00	400.00	...do...	.....do	Do.
		...do...	806.00	400.00	Bad...	.....do	Do.
1894	Stillwater, Minn.	...do...	800.00	400.00	Fair...	.....do	Do.
1894	.....do	...do...	800.00	400.00	...do...	.....do	Do.
1894	.....do	...do...	800.00	400.00	...do...	.....do	Do.
1894	.....do	...do...	800.00	400.00	...do...	.....do	Do.
1894	.....do	...do...	800.00	300.00	Bad...	.....do	Do.
1895	Rock Island, Ill.	...do...	790.00	400.00	Fair...	.....do	Do.
1895	.....do	...do...	790.00	240.00	...do...	.....do	Do.
1895	.....do	...do...	790.00	280.00	...do...	.....do	Do.
		...do...	593.18	440.00	...do...	.....do	Do.
		...do...	623.33	440.00	...do...	.....do	Do.
		...do...	594.96	440.00	...do...	.....do	Do.
		...do...	940.59	440.00	Good..	.....do	Do.
		...do...	907.47	400.00	Fair...	.....do	Do.
1903	St. Paul, Minn.	...do...	909.85	400.00	Good..	.....do	Do.
1903	.....do	...do...	909.85	540.00	...do...	.....do	Do.
1903	.....do	...do...	909.85	400.00	...do...	.....do	Do.
1903	.....do	...do...	909.85	400.00	...do...	.....do	Do.
		...do...	1,000.00	400.00	Fair...	.....do	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ROCK ISKAND, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	Ft. in.	Ft. in.	Ft. in.		
No. 221	100-ton barge	36.00	100 0	20 0	4 0	1904	Milan, Ill
No. 222	do	36.00	100 0	20 0	4 0	1904	do
No. 226	do	36.00	100 0	20 0	4 0	1904	Fountain City, Wis.
No. 227	do	36.00	100 0	20 0	4 0	1904	do
No. 228	do	36.00	100 0	20 0	4 0	1904	do
No. 229	do	36.00	100 0	20 0	4 0	1904	do
No. 240	150-ton barge	51.00	110 0	24 0	5 0	1908	South Stillwater, Minn.
No. 241	do	51.00	110 0	24 0	5 0	1908	do
No. 242	do	51.00	110 0	24 0	5 0	1908	do
No. 243	do	51.00	110 0	24 0	5 0	1908	do
No. 244	do	51.00	110 0	24 0	5 0	1908	do
No. 245	do	51.00	110 0	24 0	5 0	1908	do
No. 246	do	51.00	110 0	24 0	5 0	1908	do
No. 247	do	51.00	110 0	24 0	5 0	1908	do
No. 248	do	51.00	110 0	24 0	5 0	1908	do
No. 249	do	51.00	110 0	24 0	5 0	1909	do
No. 250	do	51.00	110 0	24 0	5 0	1909	do
No. 251	do	51.00	110 0	24 0	5 0	1909	do
No. 252	do	51.00	110 0	24 0	5 0	1909	do
No. 253	do	51.00	110 0	24 0	5 0	1909	do
No. 254	do	51.00	110 0	24 0	5 0	1909	do
No. 255	do	51.00	110 0	24 0	5 0	1909	do
No. 256	do	51.00	110 0	24 0	5 0	1909	do
No. 257	do	51.00	110 0	24 0	5 0	1909	do
No. 258	do	51.00	110 0	24 0	5 0	1909	do
No. 259	do	51.00	110 0	24 0	5 0	1909	do
No. 265	110-ton barge	42.00	100 0	20 0	4 6	1908	Fountain City, Wis.
No. 266	do	42.00	100 0	20 0	4 6	1908	do
No. 267	do	42.00	100 0	20 0	4 6	1908	do
No. 268	do	42.00	100 0	20 0	4 6	1908	do
No. 269	do	42.00	100 2	20 0	4 6	1909	do
No. 270	do	42.00	100 0	20 0	4 6	1909	do
No. 271	do	42.00	100 0	20 0	4 6	1909	do
No. 272	do	42.00	100 0	20 0	4 6	1909	do
No. 273	do	42.00	100 0	20 0	4 6	1909	do
No. 274	do	42.00	100 0	20 0	4 6	1909	do
No. 275	do	42.00	100 0	20 0	4 6	1909	do
No. 276	do	42.00	100 0	20 0	4 6	1909	do
No. 277	do	42.00	100 0	20 0	4 6	1909	do
No. 278	do	42.00	100 0	20 0	4 6	1909	do
No. 279	do	42.00	100 0	20 0	4 6	1909	do
No. 280	do	42.00	100 0	20 0	4 6	1909	do
No. 281	do	42.00	100 0	20 0	4 6	1909	do
No. 282	do	42.00	100 0	20 0	4 6	1909	do
No. 283	do	42.00	100 0	20 0	4 6	1909	do
No. 284	do	42.00	100 0	20 0	4 6	1909	do
No. 285	do	42.00	100 0	20 0	4 6	1908	Milan, Ill
No. 286	do	42.00	100 0	20 0	4 6	1908	do
No. 287	do	42.00	100 0	20 0	4 6	1908	do
No. 288	do	42.00	100 0	20 0	4 6	1908	do
No. 289	do	42.00	100 0	20 0	4 6	1908	do
No. 290	do	42.00	100 0	20 0	4 6	1908	do
No. 291	do	42.00	100 0	20 0	4 6	1908	do
No. 292	do	42.00	100 0	20 0	4 6	1908	do
No. 293	do	42.00	100 0	20 0	4 6	1908	do
No. 294	do	42.00	100 0	20 0	4 6	1908	do
No. 295	do	42.00	100 0	20 0	4 6	1908	do
No. 296	do	42.00	100 0	20 0	4 6	1908	do
No. 297	do	42.00	100 0	20 0	4 6	1908	do
No. 298	do	42.00	100 0	20 0	4 6	1908	do
No. 299	do	42.00	100 0	20 0	4 6	1908	do
No. 302	150-ton barge	51.00	110 0	24 0	5 0	1909	Keokuk, Iowa
No. 303	110-ton barge	42.00	100 0	20 0	4 6	1908	do
No. 304	do	42.00	100 0	20 0	4 6	1908	do

employed in the Engineer Department at Large on June 30, 1911—Continued.

ROCK ISLAND, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood	$992.11	$400.00	Fair..	Upper Mississippi River between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		...do...	947.64	400.00	...do...	.....do...........	Do.
		...do...	800.67	400.00	...do...	.....do...........	Do.
		...do...	839.53	400.00	...do...	.....do...........	Do.
		...do...	828.40	400.00	...do...	.....do...........	Do.
		...do...	828.15	400.00	...do...	.....do...........	Do.
		...do...	2,189.81	1,120.00	Good..	.....do...........	Do.
		...do...	1,830.49	1,120.00	...do...	.....do...........	Do.
		...do...	1,807.07	1,120.00	...do...	.....do...........	Do.
		...do...	1,739.36	1,120.00	...do...	.....do...........	Do.
		...do...	1,758.35	1,120.00	...do...	.....do...........	Do.
		...do...	1,669.48	1,120.00	...do...	.....do...........	Do.
		...do...	1,607.96	1,120.00	...do...	.....do...........	Do.
		...do...	1,661.94	1,120.00	...do...	.....do...........	Do.
		...do...	1,677.08	1,120.00	...do...	.....do...........	Do.
		...do...	1,674.67	1,120.00	...do...	.....do...........	Do.
		...do...	1,621.91	1,120.00	...do...	.....do...........	Do.
		...do...	1,636.75	1,120.00	...do...	.....do...........	Do.
		...do...	1,719.19	1,120.00	...do...	.....do...........	Do.
		...do...	1,678.07	1,120.00	...do...	.....do...........	Do.
		...do...	1,659.44	1,120.00	...do...	.....do...........	Do.
		...do...	1,649.54	1,120.00	...do...	.....do...........	Do.
		...do...	1,648.52	1,120.00	...do...	.....do...........	Do.
		...do...	1,610.94	1,120.00	...do...	.....do...........	Do.
		...do...	1,680.25	1,120.00	...do...	.....do...........	Do.
		...do...	1,738.74	1,120.00	...do...	.....do...........	Do.
		...do...	1,159.49	750.00	...do...	.....do...........	Do.
		...do...	1,154.80	750.00	...do...	.....do...........	Do.
		...do...	1,098.13	750.00	...do...	.....do...........	Do.
		...do...	1,159.96	750.00	...do...	.....do...........	Do.
		...do...	1,133.82	750.00	...do...	.....do...........	Do.
		...do...	1,160.32	750.00	...do...	.....do...........	Do.
		...do...	1,155.14	750.00	...do...	.....do...........	Do.
		...do...	1,161.32	750.00	...do...	.....do...........	Do.
		...do...	1,152.95	750.00	...do...	.....do...........	Do.
		...do...	1,155.04	750.00	...do...	.....do...........	Do.
		...do...	1,137.20	750.00	...do...	.....do...........	Do.
		...do...	1,164.31	750.00	...do...	.....do...........	Do.
		...do...	1,194.31	750.00	...do...	.....do...........	Do.
		...do...	1,268.86	750.00	...do...	.....do...........	Do.
		...do...	1,187.15	750.00	...do...	.....do...........	Do.
		...do...	1,168.83	750.00	...do...	.....do...........	Do.
		...do...	1,170.70	750.00	...do...	.....do...........	Do.
		...do...	1,145.39	750.00	...do...	.....do...........	Do.
		...do...	1,168.57	750.00	...do...	.....do...........	Do.
		...do...	1,175.87	750.00	...do...	.....do...........	Do.
		...do...	1,206.64	750.00	...do...	.....do...........	Do.
		...do...	1,151.30	750.00	...do...	.....do...........	Do.
		...do...	1,140.06	750.00	...do...	.....do...........	Do.
		...do...	1,129.90	750.00	...do...	.....do...........	Do.
		...do...	1,111.94	750.00	...do...	.....do...........	Do.
		...do...	1,092.55	750.00	...do...	.....do...........	Do.
		...do...	1,099.94	750.00	...do...	.....do...........	Do.
		...do...	1,110.71	750.00	...do...	.....do...........	Do.
		...do...	1,109.33	750.00	...do...	.....do...........	Do.
		...do...	1,106.49	750.00	...do...	.....do...........	Do.
		...do...	1,119.94	750.00	...do...	.....do...........	Do.
		...do...	1,101.31	750.00	...do...	.....do...........	Do.
		...do...	1,252.58	750.00	...do...	.....do...........	Do.
		...do...	1,148.40	750.00	...do...	.....do...........	Do.
		...do...	1,120.18	750.00	...do...	.....do...........	Do.
		...do...	1,767.85	1,130.00	...do...	.....do...........	Do.
		...do...	1,457.75	750.00	...do...	.....do...........	Do.
		...do...	1,420.16	750.00	...do...	.....do...........	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ROCK ISLAND, ILL.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 305	110-ton barge	42.00	100	0	20	0	4	6	1908	Keokuk, Iowa
No. 306	do	42.00	100	0	20	0	4	6	1908	do
No. 307	do	42.00	100	0	20	0	4	6	1908	do
No. 308	do	42.00	100	0	20	0	4	6	1908	do
No. 309	do	42.00	100	0	20	0	4	6	1908	do
No. 310	do	42.00	100	0	20	0	4	6	1908	do
No. 311	do	38.00	100	0	20	0	4	5	1909	do
No. 312	do	38.00	100	0	20	0	4	5	1909	do
No. 313	do	38.00	100	0	20	0	4	5	1909	do
No. 314	do	38.00	100	0	20	0	4	5	1909	do
No. 315	do	38.00	100	0	20	0	4	5	1909	do
No. 316	do	38.00	100	0	20	0	4	5	1909	do
No. 317	do	38.00	100	0	20	0	4	5	1909	do
No. 320	do	42.00	100	0	20	0	4	6	1909	South Stillwater, Minn.
No. 321	do	42.00	100	0	20	0	4	6	1909	do
No. 322	do	42.00	100	0	20	0	4	6	1909	do
No. 323	do	42.00	100	0	20	0	4	6	1909	do
No. 324	do	42.00	100	0	20	0	4	6	1909	do
No. 325	do	42.00	100	0	20	0	4	6	1909	do
No. 326	do	42.00	100	0	20	0	4	6	1909	do
No. 327	do	42.00	100	0	20	0	4	6	1909	do
No. 328	do	42.00	100	0	20	0	4	6	1909	do
No. 329	do	42.00	100	0	20	0	4	6	1909	do
No. 330	50-ton barge	19.00	66	0	16	0	4	6	1909	do
No. 331	do	19.00	66	0	16	0	4	6	1909	do
No. 392	110-ton barge	42.00	100	0	20	0	4	6	1910 1911	Fountain City, Wis.
No. 393	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 394	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 395	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 396	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 408	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 401	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 402	do	42.00	100	0	20	0	4	6	1910 1911	do
No. 340	40-ton barge	15.00	60	0	15	0	3	0	1910	South Stillwater, Minn.
No. 341	6-ton barge	4.00	29	0	8	0	1	6	1910	do
No. 355	150-ton barge	40.00	104	0	24	0	6	0	1911	Keokuk, Iowa
No. 356	do	40.00	104	0	24	0	6	0	1911	do

employed in the Engineer Department at Large on June 30, 1911—Continued.

ROCK ISLAND, ILL.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$1,198.19	$750.00	...do...	Upper Mississippi River between mouth of Missouri River and Minneapolis, Minn.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn., between mouth of Missouri River and Minneapolis.
		...do...	1,167.99	750.00	...do...	.....do	Do.
		...do...	1,061.72	750.00	...do...	.....do	Do.
		...do...	1,072.32	750.00	...do...	.....do	Do.
		...do...	1,061.24	750.00	...do...	.....do	Do.
		...do...	1,055.97	750.00	...do...	.....do	Do.
		...do...	1,122.72	750.00	...do...	.....do	Do.
		...do...	1,079.51	750.00	...do...	.....do	Do.
		...do...	1,100.99	750.00	...do...	.....do	Do.
		...do...	1,192.12	750.00	...do...	.....do	Do.
		...do...	1,177.01	750.00	...do...	.....do	Do.
		...do...	1,293.80	750.00	...do...	.....do	Do.
		...do...	1,130.18	750.00	...do...	.....do	Do.
		...do...	1,115.97	750.00	...do...	.....do	Do.
		...do...	1,145.41	750.00	...do...	.....do	Do.
		...do...	1,044.16	750.00	...do...	.....do	Do.
		...do...	1,041.08	750.00	...do...	.....do	Do.
		...do...	1,011.03	750.00	...do...	.....do	Do.
		...do...	1,034.46	750.00	...do...	.....do	Do.
		...do...	1,007.86	750.00	...do...	.....do	Do.
		...do...	998.71	750.00	...do...	.....do	Do.
		...do...	977.31	750.00	...do...	.....do	Do.
		...do...	1,042.29	750.00	...do...	.....do	Do.
		...do...	716.52	460.00	...do...	.....do	Do.
		...do...	717.76	460.00	...do...	.....do	Do.
		...do...	1,247.66	1,247.66	...do...	.....do	Do.
		...do...	1,259.59	1,259.59	...do...	.....do	Do.
		...do...	1,242.35	1,242.35	...do...	.....do	Do.
		...do...	1,280.12	1,280.12	...do...	.....do	Do.
		...do...	1,311.57	1,311.57	...do...	.....do	Do.
		...do...	1,145.62	1,145.11	...do...	.....do	Do.
		...do...	1,032.46	1,032.46	...do...	.....do	Do.
		...do...	1,237.51	1,237.51	...do...	.....do	Do.
		...do...	432.41	350.00	...do...	.....do	Do.
		...do...	140.43	110.00	...do...	.....do	Do.
		...do...	2,282.84	2,282.84	...do...	.....do	Do.
		...do...	2,104.81	2,104.81	...do...	.....do	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

SAN FRANCISCO (CAL.), FIRST DISTRICT.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Gen Alexander	Steamer (tow boat)	110.00	75 0	18 4	8 0	1901	San Francisco

SAN FRANCISCO (CAL.), THIRD DISTRICT.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Seizer	Stern-wheel snag boat	240.00	136 0	34 11	4 8	1881	Stockton, Cal
Tackle	Combination snag and pile-driver scow.	60.00	64 0	28 0	3 8	1908	Oakland, Cal

SAVANNAH, GA.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Cumberland	Seagoing hopper dredge.	1,905.00	200 0	40 8	20 6	1902	Belfast, Me
Savannah	do	1,461.00	177 0	38 0	10 0	1904	Sparrows Point, Md.
Morgan	Self-propelling hydraulic pipe-line dredge.	757.00	134 5	38 0	8 0	1907 1908	Baltimore, Md
Tugaloo	Stern-wheel snag boat	336.00	129 3	34 0	5 6	1902	Savannah, Ga
Oconee	do	136.00	110 0	24 0	4 6	1897	Macon, Ga
Sapelo	Steam hoister, not self-propelling, equipped with 21 cubic feet Hayward bucket and steam-drill outfit.	160.00	85 4	30 8	5 5	1894	Savannah, Ga
Augusta	Pipe-line hydraulic dredge.	101.00	74 0	28 0	4 6	1911	Jacksonville, Fla
Macon	do	101.00	74 0	28 0	4 6	1911	do
Angler	Steam launch	112.00	85 6	16 0	10 6	1905	Charleston, S. C

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[1] $23,423.92 to be added to contract price for sheathing bottom with copper, etc.

[2] Built by hired labor and purchase of material.

[3] New hull built in 1908 and machinery overhauled in 1910.

employed in the Engineer Department at Large on June 30, 1911—Continued.

SAN FRANCISCO (CAL.), FIRST DISTRICT.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1901	San Francisco...	Wood.	$20,000.00	$14,000.00	Fair...	Transferred in June, 1907, to Quartermaster's Department for temporary use of Artillery Corps in connection with torpedo instruction and practice, under authority of Secretary of War, Oct. 25, 1906 (E. D. 56191-4). Authority of Secretary of War for continuation in service of Quartermaster's Department, Dec. 14, 1909 (E. D. 56191-15). Returned to Engineer Department by Quartermaster's Department, June 29, 1911 (56191-20); out of commission; laid up at Stockton, Cal.	Fortifications, San Francisco Harbor, Cal.

SAN FRANCISCO (CAL.), THIRD DISTRICT.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Wood.	$35,000.00	$20,000.00	Fair...	Sacramento and Feather Rivers Cal.	Improving Sacramento and Feather Rivers, Cal.
......	....	...do..	6,525.00	5,500.00	Good..	.....do...........	General improvement.

SAVANNAH, GA.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Wood.	[1] $144,750.00	$165,000.00	Good..	Savannah Harbor, Ga.	Improving harbor, Savannah, Ga.
......	....	Steel..	175,500.00	200,000.00	...do..	.....do...........	Do.
......	....	...do..	119,676.21	119,676.21	....	...do..........	Do.
......	(2)............	Composite.	[3] 25,000.00	25,000.00	Good .	Savannah River, Ga.	Improving Savannah River, Ga.
1901	Brunswick, Ga..	Wood.	[4] 3,750.00	8,000.00	..do...	Altamaha, Oconee, and Ocmulgee Rivers, Ga.	Improving Altamaha, Oconee, and Ocmulgee Rivers, Ga.
......	(2)............	...do...	[5] 1,800.00	6,500.00	Fair...		
......	....	Steel..	17,875.00	17,875.00	Good .	Not yet in commission.	Improving Savannah River, Ga.
......	....	...do...	17,875.00	17,875.00	..do...	.....do..........	Do.
1905	Charleston, S. C.	Wood.	12,000.00	15,000.00	..do...	In district, as needed.	Improving harbor, Savannah, Ga.

[4] New; built in 1908.

[5] New hull and house built in 1901; new machinery in 1907; Hayward bucket and hoisting engine in 1910.

TABLE VI.—*Statement of floating plant owned by the United States and*

SAVANNAH, GA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Gibbon	Steam launch	124.00	61 9	10 0	8 8	1894	Tompkinsville, N.Y.
Gem	....do	6.00	40 0	8 0	3 0	1891	New York, N.Y.
Spray	Gasoline launch (30 horsepower).	14.00	45 0	11 0	4 6	1909	....do
Amelia	Gasoline launch (10 horsepower).	5.00	35 0	8 0	3 6	1901	Long Island, N.Y.
Cosine	Gasoline launch (5 horsepower).	3.00	26 0	7 2	3 0	1903	Baltimore, Md.
Radius	....do	2.50	18 0	5 0	1 6	1903	New York, N.Y.
Skidaway	Self-propelling quarter boat (40 horsepower), kerosene engine, stern wheel.	27.00	51 6	11 0	4 0	1907	Brunswick, Ga.
A	Pile driver with steam drill outfit.	25.00	45 3	17 0	3 6	1908	Macon, Ga.
No. 1	Pile driver	20.00	45 0	17 0	3 0	1910	....do
No. 1	30-ton barge	30.00	56 0	15 4	3 0	1910	....do
No. 2	....do	30.00	56 0	15 4	3 0	1910	....do
No. 1	96-ton derrick lighter with hoisting engine.	42.00	60 0	20 0	6 0	1908	Savannah, Ga.
No. 1	196-ton coal lighter	61.00	80 0	22 0	7 6	1908	....do

SEATTLE, WASH.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Skagit	Snag boat, combination with dredge bucket.	175.00	114 1	31 0	4 10	[4] 1896	Ballard, Wash.
Wilson	Steam tug	106.00	94 0	19 6	11 0	1899	Detroit, Mich.
Columbia River No. 1	Drill scow	100.00	100 0	26 6	4 6	1911	Wenatchee, Wash.
Columbia River No. 2	....do	100.00	100 0	26 6	4 6	1911	....do
Columbia River No. 3	....do	100.00	100 0	26 6	4 6	1911	....do
No. 1	Deck scow		100 0	32 0	8 9	1899	Seattle, Wash.
No. 2	....do		100 0	32 0	8 9	1899	....do
A (no name)	....do		80 0	26 0	8 0		Unknown
B (no name)	....do		70 0	22 0	5 0	1908	Aberdeen, Wash.
C (no name)	....do		60 0	19 0	4 0	1909	....do

ST. LOUIS, MO.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Selma [5]	Hydraulic dredge	600.00	160 0	40 0	6 0	1898	Jeffersonville, Ind.
Thebes [6]	....do	600.00	160 0	40 0	6 0	1898	....do
Fort Gage [7]	Self-propelling hydraulic dredge.	815.00	197 0	45 0	7 6	1908	Dubuque, Iowa
Fort Chartres [8]	....do	815.00	197 0	45 0	7 6	1908	....do

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[1] Transferred by the Quartermaster's Department; hull extensively repaired—new boiler in 1911 by Engineer Department.

[2] New hull built in 1907.

employed in the Engineer Department at Large on June 30, 1911—Continued.

SAVANNAH, GA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	Unknown.......	Wood.	Unknown[1]	$12,500.00	Good..	Savannah Harbor, Ga.	Improving harbor, Savannah, Ga. (temporarily).
1902	New York, N. Y.	...do...	$1,500.00	750.00	Hull bad.	.....do..........	Improving harbor, Savannah, Ga.
1909	.....do..........	...do...	4,800.00	4,800.00	Good..	In district as needed.	Improving harbor, Fernandina, Fla.
1901	Long Island, N. Y.	...do...	2,500.00	1,000.00	Fair...		Do.
1903	Baltimore, Md..	...do...	[3] 350.00	500.00	Good..		Improving Ocmulgee River, Ga.
1903	.....do..........	...do...	325.00	....	....	Savannah Harbor, Ga.	Improving harbor, Savannah, Ga.
1907	Brunswick, Ga..	...do...	3,500.00	3,500.00	Fair...	In district as needed.	Improving Altamaha and Ocmulgee Rivers, Ga.
......	(³)............	...do...	2,500.00	2,000.00	...do...	Altamaha, Oconee, and Ocmulgee Rivers, Ga.	Improving Altamaha, Oconee, and Ocmulgee Rivers, Ga.
......	(³)............	...do...	2,500.00	2,500.00	Good..		
......	(³)............	...do...	600.00	600.00	...do...		
......	(³)............	...do...	600.00	600.00	...do...		
......	(³)............	...do...	1,800.00	1,800.00	...do...	Savannah Harbor, Ga.	Improving harbor, Savannah, Ga.
......	(³)............	...do...	3,000.00	3,000.00	...do...		

SEATTLE, WASH.

......	....	Wood.	$12,000.00	$8,000.00	Poor..	Rivers of Puget Sound.	Improving Puget Sound, Wash.
......	....	Steel..	37,000.00	27,000.00	Good..	Puget Sound and Grays Harbor.	River and harbor, and fortification works.
......	....	Wood.	12,000.00	12,000.00	...do...	Columbia River.	Improving Columbia River between Bridgeport and Kettle Falls, Wash.
......	....	...do...	12,000.00	12,000.00	...do...	.....do..........	Do.
......	....	...do...	12,000.00	12,000.00	...do...	.....do..........	Do.
......	....	...do...	2,970.00	1,800.00	Fair...	Fortifications and river and harbor works.	Gun and mortar batteries.
......	....	...do...	2,970.00	1,800.00	...do...	.....do..........	Do.
......	....	...do...	750.00	750.00	...do...	Grays Harbor....	Improving Grays Harbor, Wash.
......	....	...do...	1,100.00	900.00	...do...	Skagit River.....	Do.
......	....	...do...	600.00	400.00	...do...	Grays Harbor....	Do.

ST. LOUIS, MO.

......	....	Steel..	$117,151.06	$73,672.53	Good..	Mississippi River.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouths of Ohio and Missouri Rivers.
......	....	...do...	114,574.96	67,935.33	...do...	.....do..........	Do.
......	....	...do...	177,978.98	158,085.78	...do...	.....do..........	Do.
......	....	...do...	176,795.56	157,427.60	...do...	.....do..........	Do.

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[3] Built by hired labor and purchase of material.

[4] Rebuilt.

[5] Formerly No. 3.

[6] Formerly No. 4.

[7] Formerly No. 5.

[8] Formerly No. 6.

TABLE VI.—*Statement of floating plant owned by the United States and*

ST. LOUIS, MO.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
J. N. Macomb	Snag boat	1,160.00	177	6	62	0	8	0	1874	Cincinnati, Ohio
H. G. Wright	do	1,100.00	187	0	62	0	8	0	1880	St. Louis, Mo
Gen. J. H. Simpson	Towboat	525.00	170	0	32	0	5	0	1895	Jeffersonville, Ind
Wm. R. King	do	716.00	190	0	41	0	5	0	1899	do
Cahokia[2]	Steam tender	90.00	81	0	18	0	3	3	1893	do
Cinque Hommes[7]	do	90.00	81	0	18	0	3	3	1893	do
Joachim[4]	do	90.00	81	0	18	0	3	3	1894	do
Isle de Bois[5]	do	50.00	70	0	18	0	3	6	1894	do
Aux Vasses[6]	do	50.00	70	0	18	0	3	6	1894	do
Salvisi[1]	do	150.00	100	0	24	0	4	3	1900	do
Kaskaskia[8]	do	150.00	100	0	24	0	4	3	1900	do
Meramec[9]	do	150.00	100	0	24	0	4	3	1900	do
Birch[10]	Gasoline launch	1.50	28	0	6	6	2	6	1909	Grafton, Ill
Stewart[11]	do	1.50	28	0	6	6	2	6	1909	do
No. 1	Pile driver	75.00	68	0	20	0	3	1½	1894	Cincinnati, Ohio
No. 3	do	75.00	68	0	20	0	3	1½	1894	do
No. 4	do	75.00	68	0	20	0	3	1½	1894	do
No. 5	do	75.00	68	0	20	0	3	1½	1894	do
No. 12	do	75.00	68	0	20	0	3	1½	1894	do
No. 25	do	75.00	68	0	20	0	3	1½	1893	St. Louis, Mo
No. 26	do	75.00	68	0	20	0	3	1½	1893	do
No. 28	do	75.00	68	0	20	0	3	1½	1893	do
No. 29	do	75.00	68	0	20	0	3	1½	1893	do
No. 30	do	75.00	68	0	20	0	3	1½	1893	do
No. 31	do	75.00	68	0	20	0	3	1½	1893	do
No. 32	do	75.00	68	0	20	0	3	1½	1893	do
No. 33	do	75.00	68	0	20	0	3	1½	1893	do
No. 34	do	75.00	68	0	20	0	3	1½	1893	do
No. 35	do								1893	do
No. 1	Derrick boat	75.00	68	0	20	0	3	1½	1893	do
No. 2	do	75.00	68	0	20	0	3	1½	1894	do
No. 1	Quarter boat	130.00	135	0	30	0	3	11	1893	Cincinnati, Ohio
No. 2	do	130.00	135	0	30	0	3	11	1893	do
No. 3	do	130.00	135	0	30	0	3	11	1893	do
No. 4	do	130.00	135	0	30	0	3	11	1893	do
No. 5	do	130.00	135	0	30	0	3	11	1893	do
No. 6	do	130.00	135	0	30	0	3	11	1893	do
No. 7	do	130.00	135	0	30	0	3	11	1893	Jeffersonville, Ind
No. 8	do	130.00	135	0	30	0	3	11	1893	do
No. 9	do	130.00	135	0	30	0	3	11	1893	do
No. 10	do	130.00	135	0	30	0	3	11	1893	do
No. 1	Office and survey boat	115.00	135	0	26	0	3	6	1893	Dubuque, Iowa
No. 2	do	115.00	135	0	26	0	3	6	1893	do
No. 3	do	115.00	135	0	26	0	3	6	1893	do

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[1] Extraordinary repairs, adding to value.
[2] Formerly No. 3.
[3] Formerly No. 4.
[4] Formerly No. 5.
[5] Formerly No. 6.
[6] Formerly No. 7.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ST. LOUIS, MO.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Steel..	$240,000.00	$71,055.00	Fair...	Mississippi, Atchafalaya, and Old Rivers.	Removing obstructions in Mississippi, Atchafalaya, and Old Rivers.
		...do...	190,000.00	[1]79,700.00	Good..	.....do..........	Do.
		Wood.	40,000.00	[1]25,039.38	...do...	Mississippi River.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouths of Ohio and Missouri Rivers.
		Steel..	72,000.00	[1]49,662.62	...do...	.....do..........	Do.
		Wood.	5,030.00	[1]3,482.80	Fair...	.....do..........	Do.
		...do...	5,030.00	[1]3,482.80	...do...	.....do..........	Do.
		...do...	6,990.00	[1]3,482.80	...do...	.....do..........	Do.
		...do...	4,400.00	1,200.00	Poor..	.....do..........	Do.
		...do...	4,400.00	1,200.00	...do...	.....do..........	Do.
		Steel..	19,279.50	9,736.92	Good..	.....do..........	Do.
		...do...	19,279.50	9,736.92	...do...	.....do..........	Do.
		...do...	19,279.50	14,985.92	...do.	.....do..........	Do.
		...do...	519.00	487.86	...do...	Mississippi, Atchafalaya, and Old Rivers.	Removing obstructions in Mississippi, Atchafalaya, and Old Rivers.
		...do...	519.00	487.86	...do...	.....do..........	Do.
		Wood.	4,500.00	850.00	Poor..	Mississippi River.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouth of Ohio and Missouri Rivers.
		...do...	4,500.00	850.00	...do...	.....do..........	Do.
		...do...	4,500.00	[1]750.00	...do...	.....do..........	Do.
		...do...	4,500.00	850.00	...do...	.....do..........	Do.
		...do...	4,500.00	545.48	Very poor.	.....do..........	Do.
		...do...	3,590.00	[1]3,000.00	Good..	.....do..........	Do.
		...do...	3,590.00	850.00	Poor..	.....do..........	Do.
		...do...	3,590.00	850.00	...do...	.....do..........	Do.
		...do...	3,590.00	850.00	...do...	.....do..........	Do.
		...do...	3,590.00	750.00	...do...	.....do..........	Do.
		...do...	3,590.00	750.00	...do...	.....do..........	Do.
		...do...	3,590.00	850.00	...do...	.....do..........	Do.
		...do...	3,590.00	850.00	...do...	.....do..........	Do.
		...do...	3,590.00	[1]3,000.00	Good..	.....do..........	Do.
		...do...	3,590.00	[1]750.00	Poor..	.....do..........	Do.
		...do...	4,000.00	1,232.50	Fair...	.....do..........	Do.
		...do...	4,000.00	1,629.65	...do...	.....do..........	Do.
		...do...	5,200.00	[1]4,000.00	Good..	.....do..........	Do.
		...do...	5,200.00	[1]2,000.00	Poor..	.....do..........	Do.
		...do...	5,200.00	[1]2,000.00	...do...	.....do..........	Do.
		...do...	5,200.00	4,000.00	Good..	.....do..........	Do.
		...do...	5,200.00	1,000.00	Very poor.	.....do..........	Do.
		...do...	5,200.00	4,000.00	Good..	.....do..........	Do.
		...do...	5,390.00	2,000.00	Poor..	.....do..........	Do.
		...do...	5,390.00	[1]4,000.00	Good..	.....do..........	Do.
		...do...	5,390.00	[1]1,409.12	Poor..	.....do..........	Do.
		...do...	5,390.00	1,000.00	Very poor.	.....do..........	Do.
		...do...	4,400.00	1,400.00	Fair...	.....do..........	Do.
		...do...	4,400.00	784.83	Very poor.	.....do..........	Do.
		...do...	4,400.00	1,400.00	Fair...	.....do..........	Do.

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[7] Formerly No. 8.

[8] Formerly No. 9

[9] Formerly No. 10.

[10] Formerly No. 1.

[11] Formerly No. 2.

TABLE VI.—*Statement of floating plant owned by the United States and*

ST. LOUIS, MO.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in*		
No. 4	Office and survey boat	115.00	135 0	26 0	3 6	1893	Jeffersonville, Ind
No. 5	....do	70.00	120 0	24 0	5 0	1893	Gasconade, Mo
No. 101	Model barge	425.00	135 0	28 0	5 0	1891	Cincinnati, Ohio
No. 103	....do	425.00	135 0	28 0	5 0	1891	....do
No. 104	....do	425.00	135 0	28 0	5 0	1891	....do
No. 110	....do	425.00	135 0	28 0	5 0	1891	....do
No. 114	....do	425.00	135 0	28 0	5 0	1893	Paducah, Ky
No. 116	Model barge (store boat)	425.00	135 0	28 0	5 0	1893	....do
No. 117	Model barge	425.00	135 0	28 0	5 0	1893	....do
No. 118	....do	425.00	135 0	28 0	5 0	1893	....do
No. 119	....do	425.00	135 0	28 0	5 0	1893	....do
No. 120	....do	425.00	135 0	28 0	5 0	1894	Cinicinnati, Ohio
No. 121	....do	425.00	135 0	28 0	5 0	1894	....do
No. 122	....do	425.00	135 0	28 0	5 0	1894	....do
No. 123	....do	425.00	135 0	28 0	5 0	1894	....do
No. 124	....do	425.00	135 0	28 0	5 0	1894	....do
No. 125	....do	425.00	135 0	28 0	5 0	1894	....do
No. 126	....do	425.00	135 0	28 0	5 0	1894	....do
No. 127	....do	425.00	135 0	28 0	5 0	1894	Madison, Ind
No. 128	....do	425.00	135 0	28 0	5 0	1894	....do
No. 129	....do	425.00	135 0	28 0	5 0	1894	....do
No. 130	....do	425.00	135 0	28 0	5 0	1894	....do
No. 131	....do	425.00	135 0	28 0	5 0	1894	....do
No. 132	....do	425.00	135 0	28 0	5 0	1894	....do
No. 133	....do	425.00	135 0	28 0	5 0	1894	Jeffersonville, Ind
No. 134	....do	425.00	135 0	28 0	5 0	1894	....do
No. 135	....do	425.00	135 0	28 0	5 0	1894	....do
No. 136	....do	425.00	135 0	28 0	5 0	1894	....do
No. 137	....do	425.00	135 0	28 0	5 0	1894	....do
No. 138	....do	425.00	135 0	28 0	5 0	1894	....do
No. 201	....do	425.00	135 0	28 0	5 0	1898	Madison, Ind
No. 202	....do	425.00	135 0	28 0	5 0	1898	....do
No. 204	....do	425.00	135 0	28 0	5 0	1898	....do
No. 205	....do	425.00	135 0	28 0	5 0	1898	....do
No. 206	....do	425.00	135 0	28 0	5 0	1898	....do
No. 207	....do	425.00	135 0	28 0	5 0	1898	....do
No. 208	....do	425.00	135 0	28 0	5 0	1898	....do
No. 209	....do	425.00	135 0	28 0	5 0	1898	....do
No. 210	....do	425.00	135 0	28 0	5 0	1898	....do
No. 211	....do	425.00	135 0	28 0	5 0	1898	....do
No. 212	....do	425.00	135 0	28 0	5 0	1898	....do
No. 213	....do	425.00	135 0	28 0	5 0	1898	Cincinnati, Ohio
No. 214	....do	425.00	135 0	28 0	5 0	1898	....do
No. 215	....do	425.00	135 0	28 0	5 0	1898	....do
No. 216	....do	425.00	135 0	28 0	5 0	1898	....do
No. 217	....do	425.00	135 0	28 0	5 0	1898	....do
No. 218	....do	425.00	135 0	28 0	5 0	1898	....do
No. 4	Flat barge	240.00	100 0	24 0	5 4	1893	Gasconade, Mo
No. 1	Steel barge	650.00	152 0	34 0	6 0	1911	Ambridge, Pa
No. 1	Machine shop boat	75.00	68 0	20 0	3 1½	1909	St. Louis, Mo
No. 108	Flat	25.00	40 0	16 0	2 6	1900	Leavenworth, Ind
No. 109	....do	25.00	40 0	16 0	2 6	1900	....do
No. 110	....do	25.00	40 0	16 0	2 6	1900	....do
No. 111	....do	25.00	40 0	16 0	2 6	1900	....do
No. 112	....do	25.00	40 0	16 0	2 6	1900	....do
No. 113	....do	25.00	40 0	16 0	2 6	1900	....do
No. 114	....do	25.00	40 0	16 0	2 6	1900	....do
No. 115	....do	25.00	40 0	16 0	2 6	1900	....do
No. 116	....do	25.00	40 0	16 0	2 6	1900	....do
No. 117	....do	25.00	40 0	16 0	2 6	1900	....do
No. 118	....do	25.00	40 0	16 0	2 6	1900	....do
No. 119	....do	25.00	40 0	16 0	2 6	1900	....do
No. 120	....do	25.00	40 0	16 0	2 6	1900	....do
No. 121	....do	25.00	40 0	16 0	2 6	1900	....do

[1] Extraordinary repairs, adding to value.

mployed in the Engineer Department at Large on June 30, 1911—Continued.

ST. LOUIS, MO.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$4,340.00	$1,400.00	Poor..	Mississippi River.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouths of Ohio and Missouri Rivers.
1903	Gasconade, Mo..	...do...	2,000.00	3,000.00	Good..	.....do..........	Do.
......	....	...do...	3,750.00	100.00	Very poor.	.....do..........	Do.
......	....	...do...	3,750.00	100.00	...do...	.....do..........	Do.
......	....	...do...	3,750.00	100.00	...do...	.....do..........	Do.
......	....	...do...	3,795.00	100.00	...do...	.....do..........	Do.
......	....	...do...	3,700.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,700.00	2,500.00	...do...	.....do..........	Do.
......	....	...do...	3,700.00	[1] 1,500.00	Poor..	.....do..........	Do.
......	....	...do...	3,700.00	[1] 1,500.00	...do...	.....do..........	Do.
......	....	...do...	3,700.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,847.00	[1] 1,500.00	Poor..	.....do..........	Do.
......	....	...do...	3,847.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,847.00	[1] 2,500.00	...do...	.....do..........	Do.
......	....	...do...	3,722.00	[1] 1,500.00	Poor..	.....do..........	Do.
......	....	...do...	3,847.00	[1] 1,500.00	...do...	.....do..........	Do.
......	....	...do...	3,847.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	2,885.00	[1] 2,500.00	...do...	.....do..........	Do.
......	....	...do...	3,590.00	[1] 2,500.00	...do...	.....do..........	Do.
......	....	...do...	3,590.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,590.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,590.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,590.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,590.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,650.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,650.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,650.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,650.00	[1] 3,500.00	...do...	.....do..........	Do.
......	....	...do...	3,650.00	2,000.00	...do...	.....do..........	Do.
......	....	...do...	3,650.00	[1] 124.94	Very poor.	.....do..........	Do.
......	....	...do..	3,800.00	[1] 1,000.00	Poor..	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,000.00	...do...	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,000.00	...do...	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,000.00	...do...	.....do..........	Do.
......	....	...do...	3,800.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,800 00	[1] 1,000.00	Poor..	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,000.00	...do...	.....do..........	Do.
......	....	...do...	3,800.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,500.00	Poor..	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,500.00	...do...	.....do..........	Do.
......	....	...do...	3,800.00	[1] 1,500.00	...do...	.....do..........	Do.
......	....	...do...	3,597.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,597.00	[1] 2,500.00	...do...	.....do..........	Do.
......	....	...do...	3,597.00	1,000.00	Poor..	.....do..........	Do.
......	....	...do...	3,597.00	[1] 2,500.00	Fair...	.....do..........	Do.
......	....	...do...	3,597.00	[1] 2,500.00	...do...	.....do..........	Do.
......	....	...do...	3,597.00	[1] 2,500.00	...do...	.....do..........	Do.
1903	Gasconade, Mo..	...do...	200.00	1,518.62	Good .	.....do..........	Do.
......	....	Steel..	12,016.56	12,016.56	...do...	.....do..........	Do.
......	....	Wood.	2,201.12	1,883.34	...do...	.....do..........	Do.
......	....	...do...	319.00	87.98	Poor..	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.
......	....	...do...	319.00	88.10	...do...	.....do..........	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ST. LOUIS, MO.—Continued.

Name or number.	Class and description.	Dis-place-ment.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 122	Flat	25.00	40	0	16	0	2	6	1900	Leavenworth, Ind
No. 123	do	25.00	40	0	16	0	2	6	1900	do
No. 124	do	25.00	40	0	16	0	2	6	1900	do
No. 125	do	25.00	40	0	16	0	2	6	1900	do
No. 126	do	25.00	40	0	16	0	2	6	1900	do
No. 127	do	25.00	40	0	16	0	2	6	1900	do
No. 128	do	25.00	40	0	16	0	2	6	1900	do
No. 129	do	25.00	40	0	16	0	2	6	1900	do
No. 130	do	25.00	40	0	16	0	2	6	1900	do
No. 131	do	25.00	40	0	16	0	2	6	1900	do
No. 132	do	25.00	40	0	16	0	2	6	1900	do
No. 133	do	25.00	40	0	16	0	2	6	1900	do
No. 134	do	25.00	40	0	16	0	2	6	1900	do
No. 135	do	25.00	40	0	16	0	2	6	1900	do
No. 136	do	25.00	40	0	16	0	2	6	1900	do
No. 137	do	25.00	40	0	16	0	2	6	1900	do
No. 138	do	25.00	40	0	16	0	2	6	1900	do
No. 139	do	25.00	40	0	16	0	2	6	1900	do
No. 140	do	25.00	40	0	16	0	2	6	1900	do
No. 141	do	25.00	40	0	16	0	2	6	1900	do
No. 142	do	25.00	40	0	16	0	2	6	1900	do
No. 143	do	25.00	40	0	16	0	2	6	1900	do
No. 144	do	25.00	40	0	16	0	2	6	1900	do
No. 145	do	25.00	40	0	16	0	2	6	1900	do
No. 146	do	25.00	40	0	16	0	2	6	1900	do
No. 147	do	25.00	40	0	16	0	2	6	1900	do
No. 148	do	25.00	40	0	16	0	2	6	1900	do
No. 149	do	25.00	40	0	16	0	2	6	1900	do
No. 150	do	25.00	40	0	16	0	2	6	1900	do
No. 151	do	25.00	40	0	16	0	2	6	1900	do
No. 152	do	25.00	40	0	16	0	2	6	1900	do
No. 153	do	25.00	40	0	16	0	2	6	1900	do
No. 154	do	25.00	40	0	16	0	2	6	1900	do
No. 155	do	25.00	40	0	16	0	2	6	1900	do
No. 156	do	25.00	40	0	16	0	2	6	1900	do
No. 157	do	25.00	40	0	16	0	2	6	1900	do
No. 158	do	25.00	40	0	16	0	2	6	1900	do
No. 159	do	25.00	40	0	16	0	2	6	1900	do
No. 160	do	25.00	40	0	16	0	2	6	1900	do
No. 161	do	25.00	40	0	16	0	2	6	1900	do
No. 162	do	25.00	40	0	16	0	2	6	1900	do
No. 163	do	25.00	40	0	16	0	2	6	1900	do
No. 164	do	25.00	40	0	16	0	2	6	1900	do
No. 165	do	25.00	40	0	16	0	2	6	1900	do
No. 166	do	25.00	40	0	16	0	2	6	1900	do
No. 167	do	25.00	40	0	16	0	2	6	1900	do
No. 1	Flat, steel	40.00	55	0	16	0	3	0	1903	St. Louis, Mo
No. 2	do	40.00	55	0	16	0	3	0	1903	do
No. 3	do	40.00	55	0	16	0	3	0	1903	do
No. 4	do	40.00	55	0	16	0	3	0	1903	do
No. 5	do	40.00	55	0	16	0	3	0	1903	do
No. 6	do	40.00	55	0	16	0	3	0	1903	do
No. 7	do	40.00	55	0	16	0	3	0	1903	do
No. 8	do	40.00	55	0	16	0	3	0	1903	do
No. 9	do	40.00	55	0	16	0	3	0	1911	Ambridge, Pa
No. 10	do	40.00	55	0	16	0	3	0	1911	do
No. 11	do	40.00	55	0	16	0	3	0	1911	do
No. 12	do	40.00	55	0	16	0	3	0	1911	do
No. 13	do	40.00	55	0	16	0	3	0	1911	do
No. 14	do	40.00	55	0	16	0	3	0	1911	do
No. 15	do	40.00	55	0	16	0	3	0	1911	do
No. 16	do	40.00	55	0	16	0	3	0	1911	do
No. 17	do	40.00	55	0	16	0	3	0	1911	do
No. 18	do	40.00	55	0	16	0	3	0	1911	do
No. 19	do	40.00	55	0	16	0	3	0	1911	do
No. 20	do	40.00	55	0	16	0	3	0	1911	do
No. 21	do	40.00	55	0	16	0	3	0	1911	do

employed in the Engineer Department at Large on June 30, 1911—Continued.

ST. LOUIS, MO.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	$319.00	$88.10	Poor..	**Mississippi River.**	**Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouths of Ohio and Missouri Rivers.**
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		...do...	319.00	88.10	...do...	.....do...........	Do.
		Steel..	1,741.57	1,069.66	Good..	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,741.57	1,069.67	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.
		...do...	1,690.65	1,690.65	...do...	.....do...........	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ST. LOUIS, MO.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
No. 22	Flat, steel	40.00	55 0	16 0	3 0	1911	Ambridge, Pa.
No. 23	do	40.00	55 0	16 0	3 0	1911	do.
No. 24	do	40.00	55 0	16 0	3 0	1911	do.
No. 25	do	40.00	55 0	16 0	3 0	1911	do.
No. 26	do	40.00	55 0	16 0	3 0	1911	do.
No. 27	do	40.00	55 0	16 0	3 0	1911	do.
No. 28	do	40.00	55 0	16 0	3 0	1911	do.
No. 29	do	40.00	55 0	16 0	3 0	1911	do.
No. 30	do	40.00	55 0	16 0	3 0	1911	do.
No. 31	do	40.00	55 0	16 0	3 0	1911	do.
No. 32	do	40.00	55 0	16 0	3 0	1911	do.
No. 33	do	40.00	55 0	16 0	3 0	1911	do.
No. 34	do	40.00	55 0	16 0	3 0	1911	do.
No. 35	do	40.00	55 0	16 0	3 0	1911	do.
No. 36	do	40.00	55 0	16 0	3 0	1911	do.
No. 37	do	40.00	55 0	16 0	3 0	1911	do.
No. 38	do	40.00	55 0	16 0	3 0	1911	do.
No. 39	do	40.00	55 0	16 0	3 0	1911	do.
No. 40	do	40.00	55 0	16 0	3 0	1911	do.
No. 41	do	40.00	55 0	16 0	3 0	1911	do.
No. 42	do	40.00	55 0	16 0	3 0	1911	do.
No. 43	do	40.00	55 0	16 0	3 0	1911	do.
No. 1	Yawl	1.00	25 0	4 8	2 6	1893	St. Joseph, Mich.
No. 16	do	1.00	20 0	5 5	1 10	1898	St. Louis, Mo.
No. 17	do	1.00	20 0	5 5	1 10	1898	do.
No. 18	do	1.00	20 0	5 5	1 10	1898	do.
No. 19	do	1.00	20 0	5 5	1 10	1898	do.
No. 20	do	1.00	20 0	5 5	1 10	1898	do.
No. 21	do	1.00	20 0	5 5	1 10	1898	do.
No. 22	do	1.00	20 0	5 5	1 10	1898	do.
No. 23	do	1.00	20 0	5 5	1 10	1898	do.
No. 24	do	1.00	20 0	5 5	1 10	1898	do.
No. 25	do	1.00	20 0	5 5	1 10	1898	do.
No. 26	do	1.00	20 0	5 5	1 10	1898	do.
No. 46	Skiff	.75	19 9	5 3	1 4	1893	St. Joseph, Mich.
No. 47	do	.75	19 9	5 3	1 4	1893	do.
No. 48	do	.75	19 9	5 3	1 4	1893	do.
No. 49	do	.75	19 9	5 3	1 4	1893	do.
No. 50	do	.75	19 9	5 3	1 4	1893	do.
No. 51	do	.75	19 9	5 3	1 4	1893	do.
No. 52	do	.75	19 9	5 3	1 4	1893	do.
No. 53	do	.75	19 9	5 3	1 4	1893	do.
No. 54	do	.75	19 9	5 3	1 4	1893	do.
No. 55	do	.75	19 9	5 3	1 4	1893	do.
No. 56	do	.75	19 9	5 3	1 4	1893	do.
No. 57	do	.75	19 9	5 3	1 4	1893	do.
No. 58	do	.75	19 9	5 3	1 4	1893	do.
No. 59	do	.75	19 9	5 3	1 4	1893	do.
No. 60	do	.75	19 9	5 3	1 4	1893	do.
No. 61	do	.75	19 9	5 3	1 4	1894	St. Louis, Mo.
No. 62	do	.75	19 9	5 3	1 4	1894	do.
No. 63	do	.75	19 9	5 3	1 4	1894	do.
No. 64	do	.75	19 9	5 3	1 4	1894	do.
No. 65	do	.75	19 9	5 3	1 4	1894	do.
No. 66	do	.75	19 9	5 3	1 4	1894	do.
No. 67	do	.75	19 9	5 3	1 4	1894	do.
No. 68	do	.75	19 9	5 3	1 4	1894	do.
No. 69	do	.75	19 9	5 3	1 4	1894	do.
No. 70	do	.75	19 9	5 3	1 4	1894	do.
No. 71	do	.75	19 9	5 3	1 4	1894	do.
No. 72	do	.75	19 9	5 3	1 4	1894	do.
No. 73	do	.75	19 9	5 3	1 4	1894	do.
No. 74	do	.75	19 9	5 3	1 4	1894	do.
No. 75	do	.75	19 9	5 3	1 4	1894	do.
No. 76	do	.75	19 9	5 3	1 4	1894	do.
No. 77	do	.75	19 9	5 3	1 4	1894	do.
No. 78	do	.75	19 9	5 3	1 4	1894	do.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ST. LOUIS, MO.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Steel	$1,690.65	$1,690.65	Poor	Mississippi River.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouths of Ohio and Missouri Rivers.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.65	1,690.65	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		do	1,690.64	1,690.64	do	do	Do.
		Wood	105.00	32.13	Fair	do	Do.
		do	85.00	20.00	Poor	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20 00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	85.00	20.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	29.90	6.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	20.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.
		do	30.00	8.00	do	do	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

ST. LOUIS, MO.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 79	Skiff	.75	19	9	5	3	1	4	1894	St. Louis, Mo
No. 80	do	.75	19	9	5	3	1	4	1894	do
No. 81	do	.75	19	9	5	3	1	4	1894	do
No. 82	do	.75	19	9	5	3	1	4	1894	do
No. 83	do	.75	19	9	5	3	1	4	1894	do
No. 84	do	.75	19	9	5	3	1	4	1894	do
No. 85	do	.75	19	9	5	3	1	4	1894	do
No. 86	do	.75	19	9	5	3	1	4	1894	do
No. 87	do	.75	19	9	5	3	1	4	1894	do
No. 88	do	.75	19	9	5	3	1	4	1894	do
No. 89	do	.75	19	9	5	3	1	4	1894	do
No. 90	do	.75	19	9	5	3	1	4	1894	do
No. 92	do	.75	19	9	4	8	1	4	1895	do
No. 93	do	.75	19	9	4	8	1	4	1895	do
No. 94	do	.75	19	9	4	8	1	4	1895	do
No. 97	do	.75	24	0	4	8	1	4	1895	do
No. 98	do	.75	24	0	4	8	1	4	1895	do
No. 99	do	.75	24	0	4	8	1	4	1895	do
No. 100	do	.75	24	0	4	8	1	4	1895	do
No. 101	do	.75	24	0	4	8	1	4	1895	do
No. 102	do	.75	24	0	4	8	1	4	1895	do
No. 105	do	.75	24	0	4	8	1	4	1895	do
No. 106	do	.75	24	0	4	8	1	4	1895	do
No. 107	do	.75	24	0	4	8	1	4	1895	do
No. 108	do	.75	24	0	4	8	1	4	1895	do
No. 109	do	.75	24	0	4	8	1	4	1895	do

ST. LOUIS, MO. (MISSISSIPPI RIVER COMMISSION).

Name or number.	Class and description.	Displacement.	Length.		Beam.		Depth.		When.	Where.
Beta	Hydraulic pipe-line dredge.	1,300.00	214	0	58	0	6	11	[1] 1896	Memphis, Tenn
Gamma	do	570.00	138	0	38	0	7	10	1897	Jeffersonville, Ind
Delta	do	830.00	175	0	38	0	8	0	1897	Clifton Terrace, Ill
Epsilon	do	650.00	157	0	40	0	7	6	1898	Grafton, Ill
Zeta	do	650.00	157	0	40	0	7	6	1898	do
Iota	Side-wheel pipe-line dredge.	800.00	192	0	44	0	7	0	1900	do
Kappa	do	834.00	192	0	44	0	7	0	1901	do
Henry Flad	do	834.00	192	0	44	0	7	0	[2] 1901	do
B. M. Harrod	do	1,270.00	210	0	44	0	8	6	1907	do
Mississippi	Stern-wheel steamer (inspection).	540.00	174	0	32	0	6	0	[3] 1882	Carondelet, Mo
Sachem	Stern-wheel towboat	560.00	171	6	36	0	5	6	1899	Dubuque, Iowa
Choctaw	do	560.00	171	6	36	0	5	6	1899	do
Wynoka	do	560.00	171	6	36	0	5	6	[4] 1899	do
Nokomis	do	560.00	171	6	36	0	5	6	1899	do
Leota	do	560.00	171	6	36	0	5	6	1899	do
Search [5]	Stern-wheel steamer (inspection).	200.00	120	6	22	3	4	0	1893	Marietta, Ohio
Patrol [6]	Stern-wheel survey boat	220.00	130	8	28	0	4	9	[7] 1883	Pittsburgh, Pa
Vulcan	do	83.00	80	0	17	0	3	9	1897	Dubuque, Iowa
Mercury	do	83.00	80	0	17	0	3	9	1899	Jeffersonville, Ind
Venus	do	83.00	80	0	17	0	3	9	1899	do
Mars	do	83.00	80	0	17	0	3	9	1899	do

[1] Rebuilt 1898, Des Moines Rapids Canal Dry Dock.

[2] Upper works burned Jan. 11, 1908; rebuilt at West Memphis, Ark., February, 1908, to June, 1909.

[3] Upper works burned 1892; rebuilt at St. Louis, Mo., 1893.

[4] Upper works burned Oct. 15, 1901; rebuilt at Jeffersonville, Ind., March–June, 1903. Upper works damaged by sinking Nov. 23, 1908; rebuilt at New Orleans, La., December, 1909, to June, 1909.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ST. LOUIS, MO.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$30.00	$8.00	Poor..	Mississippi River.	Improving Mississippi River from mouth of Ohio River to Minneapolis, Minn.; for between mouths of Ohio and Missouri Rivers.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	8.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	30.00	10.00	..do..	.....do..........	Do.
......	....	..do..	60.00	20.00	..do..	.....do..........	Do.
......	....	..do..	60.00	20.00	..do..	.....do..........	Do.

ST. LOUIS, MO. (MISSISSIPPI RIVER COMMISSION).

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Steel..	$218,782.25	$90,250.00	Good..	Mississippi River between Cairo and Head of Passes.	Improving Mississippi River, under Mississippi River Commission; works in charge of Secretary.
......	....	..do..	85,530.60	42,100.00	..do..	.....do..........	Do.
......	....	..do..	124,940.00	41,750.00	..do..	.....do..........	Do.
......	....	..do..	102,000.00	36,800.00	..do..	.....do..........	Do.
......	....	..do..	109,000.00	36,350.00	..do..	.....do..........	Do.
......	....	..do..	100,479.79	49,550.00	..do..	.....do..........	Do.
......	....	..do..	122,400.00	78,000.00	..do..	.....do..........	Do.
......	....	..do..	122,400.00	92,850.00	..do..	.....do..........	Do.
......	....	Iron and steel.	238,998.17	195,500.00	..do..	.....do..........	Do.
......	....	Steel..	45,000.00	15,750.00	..do..	.....do..........	Do.
......	....	..do..	45,672.00	20,750.00	..do..	.....do..........	Do.
......	....	..do..	45,672.00	20,750.00	..do..	.....do..........	Do.
......	....	Steel..	45,672.00	20,750.00	..do..	.....do..........	Do.
......	....	..do..	45,672.00	20,750.00	..do..	.....do..........	Do.
......	....	..do..	46,672.00	20,750.00	..do..	.....do..........	Do.
1895	St. Louis, Mo...	Wood.	9,000.00	3,800.00	..do..	.....do..........	Do.
1883	.....do..........	..do..	14,550.00	4,400.00	..do..	.....do..........	Do.
......	....	Steel..	7,080.00	3,300.00	..do..	.....do..........	Do.
......	....	..do..	7,749.00	3,300.00	..do..	.....do..........	Do.
......	....	..do..	7,749.00	3,300.00	..do..	.....do..........	Do.
......	....	..do..	7,749.00	3,300.00	..do..	.....do..........	Do.

[5] Formerly No. 96235, H. D. Munson.
[6] Formerly No. 150299.
[7] Rebuilt 1896 at Jeffersonville, Ind.; hull rebuilt, 1904, at Paducah, Ky.

TABLE VI.—*Statement of floating plant owned by the United States and*

ST. LOUIS, MO. (MISSISSIPPI RIVER COMMISSION)—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
Metric	Gasoline launch	2.00	22	3	5	0	2	3	1908	St. Louis, Mo
MRC 1	Gasoline motor skiff		19	6	4	10	1	3	[1] 1909	Leavenworth, Ind
971	Pile sinker	56.00	76	0	25	0	3	10	1897	Cincinnati, Ohio
981	do	56.00	76	0	25	0	3	10	1898	do
982	do	56.00	76	0	25	0	3	10	1898	do
983	do	56.00	76	0	25	0	3	10	1898	do
13	do	54.00	68	0	20	0	3	6	1894	do
Illinois	Quarter boat	72.00	107	6	27	2	4	6	([2])	Unknown
041	35-ton barge	35.00	80	0	20	0	4	0	1904	West Memphis, Ark.
051	do	35.00	80	0	20	0	4	0	1905	do
1	Pump boat	30.00	65	0	16	0	4	6	1905	do
1	Calking flat		24	6	6	0	1	2	1904	do

ST. PAUL, MINN.

Name or number.	Class and description.	Displacement.	Length.		Beam.		Depth.		When.	Where.
Ogama	Stern-wheel steamboat	106.00	112	6	23	3	4	0	1887	Grand Forks, N. Dak.
Oriole	do	60.00	107	0	22	4	4	1	1908	Aitkin, Minn
Ottertail	Dipper dredge	120.00	75	0	24	0	6	0	1882	Grand Forks, N. Dak.
Quarter boat No. 2	House boat	36.00	48	0	16	0	3	6	1882	Moorhead, Minn
Slide scow No. 1	Decked scow with slide	20.00	64	6	16	0	3	6	1882	Grand Forks, N. Dak.
Barge No. 5	Decked barge	20.00	64	4	16	0	3	6	1892	do
St. Croix	Stern-wheel suction dredge.	130.00	80	0	22	0	5	0	1898	St. Paul Park, Minn.
3 barges	Conveyor pipe barges	[3] 3.00	24	0	8	0	2	3	1900	Fort Snelling, Minn.
Barge	Wood barge	18.00	50	0	14	0	3	6	1898	St. Paul Park, Minn.
Quarter boat No. 3	House boat	39.00	52	0	16	0	3	5	1905	St. Paul, Minn
Warroad	Stern-wheel suction dredge.	260.00	100	0	27	0	8	6	1904	Warroad, Minn
11 pipe floats	Pipe floats with pipe and connections.	[3] 4.00	24	0	10	0	2	4	1904	do
Barge	Wood barge	15.00	50	0	14	0	2	11	1904	do
Barge	Derrick boat	15.00	50	0	14	0	2	11	1906	do
2 barges	Decked barges	22.00	60	0	12	0	3	0	1899	Leech Lake Dam, Minn.
Bull Calf	Gasoline launch	1.00	23	0	6	0	3	4	1906	Roseau, Minn

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[1] Altered to motor skiff, West Memphis, Ark., 1910.

[2] Hull rebuilt, 1895, at Madison, Ind.

[3] Approximate.

[4] Without machinery; machinery was taken from condemned steamboat pertaining to reservoirs at headwaters of Mississippi River.

employed in the Engineer Department at Large on June 30, 1911—Continued.

ST. LOUIS, MO. (MISSISSIPPI RIVER COMMISSION)—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1910	St. Louis, Mo...	Wood.	$325.00	$300.00	Good .	Mississippi River between Cairo and Head of Passes.	Improving Mississippi River, under Mississippi River Commission; works in charge of Secretary.
1909	Leavenworth, Ind.	...do..	263.67	250.00	...do..	.....do..........	Do.
		...do..	2,165.00	500.00	...do..	.....do..........	Do.
		...do..	2,384.00	200.00	...do..	.....do..........	Do.
		...do..	2,384.00	200.00	...do..	.....do..........	Do.
		...do..	2,384.00	200.00	...do..	.....do..........	Do.
		...do..	4,500.00	700.00	...do..	.....do..........	Do.
		...do..	Unknown.	650.00	Fair...	.....do..........	Do.
		...do..	1,205.96	500.00	...do..	.....do..........	Do.
		...do..	1,605.47	900.00	...do..	.....do..........	Do.
		...do..	1,456.02	800.00	Good .	.....do..........	Do.
		...do..	52.77	10.00	Fair...	.....do..........	Do.

ST. PAUL, MINN.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
		Oak and pine.	[4] $5,687.06	$3,000.00	Poor..	Red River of the North.	Improving Red River of the North, Minn. and Dak.
1910	Sandy Lake Dam, Minn.	...do..	3,500.00	3,500.00	Good .	Mississippi River.	Improving Mississippi River between Brainerd and Grand Rapids, Minn.
		Fir....	12,600.00	5,000.00	Fair...	Red River of the North.	Improving Red River of the North, Minn. and Dak.
		Fir and pine.	669.67	350.00	...do..	.....do..........	Do.
		...do..	906.65	350.00	...do..	.....do..........	Do.
		...do..	688.95	300.00	...do..	.....do..........	Do.
		Fir....	[5] 6,427.77	1,000.00	Poor..	St. Croix and Minnesota Rivers.	Improving St. Croix River, Wis. and Minn.
		Pine ..	[6] 30.00	[6] 10.00	...do..	.....do..........	Do.
		Fir....	427.20	100.00	...do..	.....do..........	Improving Chippewa River, Wis.
		...do..	[7] 500.00	400.00	Good .	.....do..........	Improving Mississippi River between Minneapolis and St Paul.
		Oak and fir.	26,500.00	18,000.00	Fair...	Warroad Harbor and River.	Improving Warroad Harbor and River, Minn.
		Tamarack.	2,145.00	1,100.00	...do..	.....do..........	Do.
		Fir....	450.00	325.00	...do..	.....do..........	Do.
		...do..	425.00	325.00	...do..	.....do..........	Do.
		...do..	[6] 335.00	[6] 135.00	...do..	Pokegama and Sandy Lake Dams.	Reservoirs at headwaters of Mississippi River.
1911	Warroad, Minn.	Oak and pine.	375.00	375.00	Good .	Warroad Harbor and River.	Improving Warroad Harbor and River, Minn. and Zippel Bay, Lake of the Woods.

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[5] Being dismantled at Lock and Dam No. 1.
[6] Each.
[7] Was changed from barge to quarter boat July, 1910.

TABLE VI.—*Statement of floating plant owned by the United States and*

VICKSBURG, MISS.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Ben. Humphreys	Combination snag boat and bucket dredge.	286.60	137 0	32 0	5 0	1908	Jeffersonville, Ind.
Jos. E. Ransdell	do	286.60	137 0	32 0	5 0	1908	do
Columbia[1]	Stern-wheel snag boat	136.87	121 0	26 0	3 3	[2] 1877	Gainesville, Miss.
Thos. B. Florence	do	107.00	96 0	20 0	4 0	[3] 1875	South St. Louis, Mo.
C. W. Howell	do	304.46	146 0	36 0	5 0	[4] 1881	do
Parker[5]	Screw-propelled steam tug.	98.00	65 0	16 4	7 2	1885	St. Louis, Mo.
Control[6]	Stern-wheel steamboat	232.90	136 0	29 0	4 0	1905	Jeffersonville, Ind.
H. St. L. Coppee	Stern-wheel towboat	350.45	140 0	30 0	6 0	1904	do
Arthur Hider	do	350.45	140 0	30 0	6 0	1898	do
Ouachita[7]	Gasoline launch	17.00	65 5	10 5	3 2	1897	Charleston, W. Va.
No. 1015	Dry dock	384.20	156 0	54 6	4 9	1910	Ambridge, Pa.
No. 78	Carpenter boat	115.00	100 0	25 0	5 0	1883	(8)
No. 222	Machine-shop boat	184.00	120 0	30 0	6 0	1883	(8)
No. 579	Steam hydraulic grader	229.00	120 0	30 0	6 0	1904	Levanna, Ohio.
No. 1	Steam derrick boat	105.55	95 0	32 0	2 6	1909	Vicksburg, Miss.
No. 2	do	54.17	65 0	24 0	3 6	1910	Arkadelphia, Ark.
No. 2	Quarter boat	25.62	59 6	15 6	3 0	1897	Yazoo City, Miss.
No. 3	do	25.67	57 9	16 0	2 8	1897	Camden, Ark.
No. 5	do	34.13	68 3	18 0	3 5	1904	Shreveport, La.
No. 9	do	34.00	68 0	18 0	4 0	1908	do
No. 10	do	34.00	68 0	18 0	4 0	1908	Jonesville, La.
No. 11	do	34.00	68 0	18 0	4 0	1908	Vicksburg, Miss.
No. 12	do	20.00	45 0	16 0	3 0	1909	Grand Ecore, La.
No. 17	do	89.00	85 0	23 0	3 0	1882	Jeffersonville, Ind.
No. 86	do	87.00	100 0	28 0	5 0	1883	(8)
No. 87	do	87.00	100 0	28 0	5 0	1883	(8)
No. 88	do	107.00	120 0	28 0	6 0	1883	(8)
No. 131	do	186.00	131 0	30 0	5 0	1881	Stillwater, Minn.
No. 155	do	107.00	120 0	28 0	6 0	1883	(8)
No. 156	do	107.00	120 0	28 0	6 0	1883	(8)
No. 157	do	107.00	120 0	28 0	6 0	1883	(8)
No. 158	do	107.00	120 0	28 0	6 0	1883	(8)
No. 159	do	107.00	120 0	30 0	6 0	1883	(8)
No. 1010	do	177.00	135 0	34 0	5 0	1910	Keokuk, Iowa.
No. 28	Mattress boat	115.00	160 0	32 0	6 0	1899	Jeffersonville, Ind.
No. 29	do	115.00	160 0	32 0	6 0	1899	do
No. 30	do	119.00	140 0	34 0	6 0	1907	do
No. 31	do	119.00	140 0	34 0	6 0	1907	do
No. 32	do	119.00	135 0	34 0	5 0	1908	do
No. 33	do	119.00	135 0	34 0	5 0	1908	do

[1] Formerly No. 125676, Col. Hooker.

[2] Hull rebuilt at Vicksburg, Miss., 1908.

[3] Repaired, 1885, South St. Louis, Mo.; repaired, 1900, Dubuque, Iowa.

mployed in the Engineer Department at Large on June 30, 1911—Continued.

VICKSBURG, MISS.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Iron and steel.	$42,483.00	$36,000.00	Good	Yazoo River, Miss.	Improving Yazoo River, Miss.
		do	42,483.00	36,000.00	do	Ouachita River, La. and Ark.	Improving Ouachita River, Ark. and La.
1888	Shreveport, La.	Wood.	1,800.00	3,000.00	do	Red River, La. and Ark.	Improving Ouachita River, Ark. and La., and Yazoo River, Miss.
1875	South St. Louis, Mo.	Iron and steel.	14,000.00	4,000.00	do	Ouachita River, La.	Improving Red River, La. and Ark.
		do	44,650.00	11,500.00	Fair	Red River, Ark. and La.	Do.
1890	St. Louis, Mo.	Wood.	6,500.00	500.00	Bad	Mississippi River, third district.	Improving Mississippi River.
1906	Paducah, Ky.	do	12,000.00	4,800.00	Fair	do	Do.
		Steel.	53,900.00	32,500.00	Good	do	Do.
		do	37,450.00	24,500.00	do	do	Do.
1903	Charleston, W. Va.	do	5,490.00	4,000.00	Poor	Yazoo River, Miss.	Improving Ouachita River, Ark. and La.
		do	39,000.00	39,000.00	Good	Mississippi River, third district.	Improving Mississippi River.
		Wood.	(3)	1,800.00	Fair	do	Do.
		do	(3)	2,400.00	Good	do	Do.
		do	15,000.00	12,000.00	do	do	Do.
		do	3,200.00	2,700.00	do	Big Sunflower River, Miss.	Improving Big Sunflower River, Miss.
		do	3,600.00	3,300.00	do	Ouachita River, Ark.	Improving Ouachita River, Ark. and La.
		do	650.00	500.00	Fair	Tallahatchie River, Miss.	Improving Yazoo River, Miss.
1897	Camden, Ark.	do	600.00	500.00	do	Bayou Bartholomew, Ark.	Improving Ouachita River, Ark. and La.
		do	1,810.00	800.00	do	Red River, La.	Improving Red River, La. and Ark.
		do	1,300.00	900.00	Good	Red River, Ark.	Do.
		do	1,400.00	900.00	do	Ouachita River, Ark.	Improving Ouachita River, Ark. and La.
		do	1,500.00	1,000.00	do	Yazoo River, Miss.	Improving Big Sunflower River, Miss.
		do	300.00	100.00	Bad	Saline River, Ark.	Improving Red River, La. and Ark.
		do	(3)	270.00	Fair	Mississippi River, third district.	Improving Mississippi River.
		do	(3)	1,350.00	do	do	Do.
		do	(3)	2,400.00	do	do	Do.
		do	(3)	2,500.00	do	do	Do.
		do	5,000.00	1,500.00	do	do	Do.
		do	(3)	2,600.00	do	do	Do.
		do	(3)	2,600.00	do	do	Do.
		do	(3)	1,200.00	do	do	Do.
		do	(3)	2,000.00	do	do	Do.
		do	Unknown.	2,400.00	do	do	Do.
		do	8,500.00	8,500.00	Good	do	Do.
		do	4,705.00	800.00	Fair	do	Do.
		do	4,705.00	800.00	do	do	Do.
		do	6,956.00	4,400.00	do	do	Do.
		do	6,956.00	4,400.00	Good	do	Do.
		do	6,900.00	5,500.00	Fair	do	Do.
		do	6,900.00	5,500.00	do	do	Do.

[4] Repaired, 1900, at Dubuque, Iowa.

[5] Formerly No. 150848.

[6] Formerly No. 202126, Scimitar II.

[7] Formerly No. 92850, Madge.

TABLE VI.—*Statement of floating plant owned by the United States and*

VICKSBURG, MISS.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 77	Scow barge	75.00	100	0	25	0	5	0	1882	(1)
No. 111	do	25.00	60	0	15	0	3	0	1884	(1)
No. 564	do	80.00	120	0	30	0	6	0	1894	Levanna, Ohio
No. 566	do	80.00	120	0	30	0	6	0	1900	do
No. 567	do	80.00	120	0	30	0	6	0	1900	do
No. 568	do	80.00	120	0	30	0	6	0	1900	do
No. 571	do	80.00	120	0	30	0	6	0	1900	do
No. 572	do	80.00	120	0	30	0	6	0	1900	do
No. 573	do	80.00	120	0	30	0	6	0	1900	do
No. 574	do	80.00	120	0	30	0	6	0	1900	do
No. 575	do	80.00	120	0	30	0	6	0	1900	do
No. 577	do	80.00	120	0	30	0	6	0	1900	do
No. 580	do	80.00	120	0	30	0	6	0	1904	do
No. 581	do	80.00	120	0	30	0	6	0	1904	do
No. 582	do	80.00	120	0	30	0	6	0	1904	do
No. 583	do	80.00	120	0	30	0	6	0	1904	do
No. 584	do	80.00	120	0	30	0	6	0	1904	do
No. 585	do	80.00	120	0	30	0	6	0	1904	do
No. 586	do	80.00	120	0	30	0	6	0	1904	do
No. 587	do	80.00	120	0	30	0	6	0	1904	do
No. 588	do	80.00	120	0	30	0	6	0	1904	do
No. 589	do	80.00	120	0	30	0	6	0	1904	do
No. 590	do	80.00	120	0	30	0	6	0	1907	do
No. 591	do	80.00	120	0	30	0	6	0	1907	do
No. 592	do	80.00	120	0	30	0	6	0	1907	do
No. 593	do	80.00	120	0	30	0	6	0	1907	do
No. 594	do	80.00	120	0	30	0	6	0	1907	do
No. 595	do	80.00	120	0	30	0	6	0	1907	do
No. 596	do	80.00	120	0	30	0	6	0	1907	do
No. 07X	do	80.00	120	0	30	0	6	0	1907	do
No. 081	do	80.00	120	0	30	0	6	0	1908	do
No. 082	do	80.00	120	0	30	0	6	0	1908	do
No. 083	do	80.00	120	0	30	0	6	0	1908	do
No. 084	do	80.00	120	0	30	0	6	0	1908	do
No. 085	do	80.00	120	0	30	0	6	0	1908	do
No. 086	do	80.00	120	0	30	0	6	0	1908	do
No. 116	do	69.47	69	0	29	0	4	0	1907	Vicksburg, Miss.
No. 9081	do	27.80	50	0	20	0	4	0	1908	do
No. 9082	do	63 20	100	0	25	0	5	0	1908	do
No. 9084	do	63.20	100	0	25	0	5	0	1908	do
No. 9083	do	40.30	60	0	25	0	5	0	1908	Vicksburg, Miss.
No. 9085	do	38.20	60	0	25	0	5	0	1908	do
No. 90811	do	70.00	90	0	30	0	4	0	(1)	Not known
No. 90812	do	71.00	50	0	24	0	3	0	(1)	do
No. 90813	do	56.00	100	0	24	0	5	0	(1)	do
No. 90814	do	47.00	50	0	30	0	4	0	(1)	do
No. 101	do	71.25	120	0	30	0	6	0	1910	Keokuk, Iowa
No. 102	do	71.25	120	0	30	0	6	0	1910	do
No. 103	do	71.25	120	0	30	0	6	0	1910	do
No. 104	do	71.25	120	0	30	0	6	0	1910	do
No. 105	do	71.25	120	0	30	0	6	0	1910	do
No. 106	do	71.25	120	0	30	0	6	0	1910	do
No. 107	do	71.25	120	0	30	0	6	0	1910	do
No. 108	do	71.25	120	0	30	0	6	0	1910	do
No. 109	do	25.00	64	0	16	0	3	0	1910	do
No. 1011	do	102.10	120	0	30	0	6	0	1910	Ambridge, Pa.
No. 1012	do	102.10	120	0	30	0	6	0	1910	do
No. 1013	do	102.10	120	0	30	0	6	0	1910	do
No. 1014	do	102.10	120	0	30	0	6	0	1910	do

[1] Not known.

employed in the Engineer Department at Large on June 30, 1911—Continued.

VICKSBURG, MISS.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
		Wood.	Unknown.	$1,000.00	Fair	Ouachita River, La.	Improving Mississippi River.
		do	$750.00	400.00	do	Mississippi River, third district.	Do.
		do	2,970.00	1,800.00	do	do	Do.
		do	2,846.00	1,500.00	do	Ouachita River, La.	Do.
		do	2,846.00	2,000.00	do	Mississippi River, third district.	Do.
		do	2,846.00	1,800.00	do	do	Do.
		do	2,846.00	600.00	do	do	Do.
		do	2,846.00	2,000.00	do	do	Do.
		do	2,846.00	1,800.00	do	do	Do.
		do	2,846.00	2,400.00	do	do	Do.
		do	2,846.00	1,900.00	do	do	Do.
		do	2,846.00	1,900.00	Bad	do	Do.
		do	3,184.00	1,800.00	Fair	do	Do.
		do	3,184.00	1,800.00	do	do	Do.
		do	3,184.00	1,800.00	do	do	Do.
		do	3,184.00	1,500.00	do	do	Do.
		do	3,184.00	1,500.00	do	do	Do.
		do	3,184.00	1,500.00	do	do	Do.
		do	3,184.00	1,900.00	do	do	Do.
		do	3,184.00	1,500.00	do	do	Do.
		do	3,184.00	1,500.00	Bad	do	Do.
		do	3,184.00	1,700.00	Fair	do	Do.
		do	3,972.00	2,600.00	do	do	Do.
		do	3,972.00	2,600.00	do	do	Do.
		do	3,972.00	2,600.00	do	do	Do.
		do	3,972.00	2,600.00	do	do	Do.
		do	4,200.00	3,000.00	do	do	Do.
		do	4,200.00	3,000.00	do	do	Do.
		do	4,200.00	3,000.00	Good	do	Do.
		do	4,200.00	3,000.00	Fair	do	Do.
		do	4,200.00	3,400.00	Good	do	Do.
		do	4,200.00	3,300.00	do	do	Do.
		do	4,200.00	3,300.00	do	do	Do.
		do	4,200.00	3,300.00	do	do	Do.
		do	4,200.00	3,300.00	do	do	Do.
		do	4,200.00	2,500.00	Fair	Ouachita River, Ark.	Do.
		do	2,100.00	800.00	Bad	Tallahatchie River, Miss.	Improving Big Sunflower River, Miss.
		do	1,200.00	900.00	Fair	Ouachita River, Ark.	Improving Ouachita River, Ark. and La.
		do	2,600.00	1,500.00	do	do	Do.
		do	2,600.00	1,500.00	do	do	Do.
		do	1,700.00	1,000.00	do	do	Do.
		do	1,700.00	1,000.00	do	do	Do.
1908	Monroe, La	do	260.00	100.00	Poor	Ouachita River, La.	Do.
1908	do	do	100.00	75.00	do	do	Do.
1908	do	do	100.00	100.00	do	do	Do.
1908	do	do	500.00	150.00	do	do	Do.
		do	3,650.00	3,600.00	Good	Mississippi River, third district.	Improving Mississippi River.
		do	3,650.00	3,600.00	do	do	Do.
		do	3,650.00	3,600.00	do	do	Do.
		do	3,650.00	3,600.00	do	do	Do.
		do	3,650.00	3,600.00	do	do	Do.
		do	3,650.00	3,600.00	do	do	Do.
		do	3,650.00	3,600.00	do	do	Do.
		do	3,650.00	3,600.00	do	do	Do.
		do	850.00	1,000.00	do	do	Do.
		Steel	9,400.00	9,400.00	do	do	Do.
		do	9,400.00	9,400.00	do	do	Do.
		do	9,400.00	9,400.00	do	do	Do.
		do	9,400.00	9,400.00	do	do	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

VICKSBURG, MISS.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
No. 9111	Scow barge	117.00	80 0	40 0	4 0	1911	Monroe, La.
No. 9113	.....do	36.00	60 0	25 0	4 0	1911	.....do
No. 9112	Catamaran barge	71.00	60 0	30 0	4 0	1911	.....do
No. 1	Flatboat	1.67	30 0	6 0	1 0	1894	Greenville, Miss.
No. 2	.....do	1.67	30 0	6 0	1 0	1894	.....do
No. 3	.....do	1.67	30 0	6 0	1 0	1894	.....do

WASHINGTON BARRACKS, D. C.

Engineer	Naphtha launch	4.00	30 0	6 6	2 8	1898	Gas Engine & Power Co., New York City.
Pontonier	Steamboat	50.00	80 0	18 0	3 6	1903	Gas Engine & Power Co. and Chas. L. Seabury & Sons' Co., New York City.

WASHINGTON, D. C.

Dalecarlia	Hydraulic dredge, 10-inch.	132.00	66 0	24 0	6 0	1908	Dalecarlia Reservoir, D. C.
York [1]	Combination derrick and pile driver.	118.00	72 0	22 0	6 0	1891	Petersburg, Va.
No. 2	Pile driver	50.00	53 5	20 1	3 10	1899	Chesapeake Beach, Md.
Chipeta	Steamer	45.00	66 0	14 0	8 1	1893	Jamestown, R. I.
Gen. Warren	.....do	75.00	72 2	17 0	5 0	1888	Peekskill, N. Y.
Powhatan	Gasoline launch	7.00	40 2	9 9	4 8	1910	St. Joseph, Mich.
Relee	.....do	5.30	30 0	7 6	3 1	([2])	Unknown.
No. 1	Quarter boat	64.00	80 2	19 1	4 2	1892	Petersburg, Va.
No. 1	50-ton scow		68 6	22 0	5 0	1889	.....do
No. 2	30-ton scow		60 0	20 0	4 0	1893	Baltimore, Md.
No. 3	50-ton scow		70 0	22 0	5 9	([2])	Unknown.
A	8-ton scow		20 8	8 0	2 0	1898	Washington, D. C.
B	.....do		20 0	12 0	1 0	1907	.....do
C	40-ton scow		60 4	13 2	4 0	1896	.....do
D	Scow (foot)		16 0	4 0	1 0	1906	.....do
E	.....do		16 0	4 0	1 0	1906	.....do
No. 1	Life boat		16 5	5 2	2 3	1904	.....do
No. 1	Rowboat		21 9	6 0	2 3	1888	Baltimore, Md.
No. 2	.....do		18 1	4 10	1 3	([2])	Unknown.

[1] Rebuilt in 1910.

[2] Unknown.

employed in the Engineer Department at Large on June 30, 1911—Continued.

VICKSBURG, MISS.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$3,775.00	$3,775.00	Good..	Ouachita River, La.	Improving Ouachita River, Ark. and La.
......	....	...do...	2,300.00	2,300.00	...do...	.....do..........	Do.
......	....	...do...	2,050.00	2,050.00	...do...	.....do..........	Do.
......	....	...do...	60.00	15.00	Fair...	Mississippi River, third district.	Improving Mississippi River.
......	....	...do...	60.00	15.00	...do...	.....do..........	Do.
......	....	...do...	60.00	20.00	...do...	.....do..........	Do.

WASHINGTON BARRACKS, D. C.

1898	New York City.	Wood.	$1,800.00	$750.00	Poor..	Washington Barracks, D. C.	Instruction of engineer troops at the Engineer School, Washington Barracks, D. C.
1903	.....do..........	Steel..	18,750.00	12,500.00	Very good.	.....do..........	Do.

WASHINGTON, D. C.

1908	Washington, D. C.	Wood.	$26,400.00	$6,480.00	Good..	Dalecarlia Reservoir.	Washington Aqueduct, D. C.
1891	Petersburg, Va..	...do...	6,129.75	6,000.00	...do...	Rappahannock, York, and Mattaponi Rivers, etc.	River and harbor works.
1907	District of Columbia.	...do...	2,250.00	1,800.00	Fair...	.....do..........	Do.
1906	Boston, Mass.....	...do...	Unknown.	5,500.00	Good..	James River, Va.	River and harbor works, improving James River, Va.
1888	Peekskill, N. Y..	...do...	5,500.00	2,000.00	Fair...	Potomac River, and other rivers in this district.	River and harbor works.
1911	St. Joseph, Mich.	...do...	2,890.00	2,890.00	Good..	James River, Va.	River and harbor works, improving James River Va.
1907	Norfolk, Va.....	...do...	999.32	750.00	Fair...	Potomac River at Washington.	Improving Potomac River.
1892	Petersburg, Va..	...do...	2,476.17	500.00	...do...	James River, Va.	Improving James River, Va.
1889	.....do..........	...do...	1,096.32	50.00	Bad...	.....do..........	Do.
1893	Baltimore, Md..	...do...	971.50	60.00	...do...	.....do..........	Do.
(a)	....	...do ..	....	1,200.00	Good..	Potomac River at Washington.	River and harbor works.
......	....	...do...	60.00	....	Bad...	Dalecarlia Reservoir.	Washington Aqueduct.
1907	Washington, D. C.	...do...	225.00	150.00	Good..	.....do..........	Do.
......	....	...do...	450.00	....	Bad...	.....do..........	Do.
......	....	...do...	20.00	5.00	Fair...	Potomac River at Washington, D. C.	River and harbor works.
......	....	...do...	20.00	5.00	...do...	.....do..........	Do.
1904	Washington, D. C.	Iron...	77.50	60.00	Good..	.....do..........	Do.
1888	Baltimore, Md..	...do...	132.00	40.00	Fair...	James River, Va.	Improving James River, Va.
1893	Washington, D. C.	Wood.	33.95	5.00	...do...	.....do..........	Do.

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[a] Raised from Occoquan Creek.

TABLE VI.—*Statement of floating plant owned by the United States and*

WASHINGTON, D. C.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft.in.*	*Ft.in.*	*Ft.in.*		
No. 3	Rowboat		16 0	4 5	1 0	1894	West Point, Va
No. 4	do		18 5	4 10	1 3	(1)	Unknown
No. 5	do		15 8	4 1	1 6	1898	Washington, D. C.
No. 6	do		17 6	5 0	2 2	1898	Baltimore, Md
No. 7	do		16 0	6 0	1 11	1902	Washington, D. C.
No. 8	do		14 6	4 6	1 3	(1)	Unknown
No. 9	do		16 2	4 4	1 6	1903	Washington, D. C.
No. 10	do		16 0	4 0	1 3	1904	do
No. 11	do		10 6	3 4	1 4	1904	do
No. 12	do		18 2	4 7	1 7	1904	do
No. 13	do		14 8	4 5	1 11	(1)	Unknown
No. 14	do		14 8	4 5	1 11	(1)	do
No. 15	do		18 0	6 0	1 6	1907	Washington, D. C.
No. 16	do		18 8	5 5	1 7	1910	Richmond, Va
No. 17	do		19 8	5 4	1 6	1910	do
No. 18	do		19 10	5 5	1 7	1910	do
No. 19	do		17 11	4 10	1 4	1910	do
No. 20	do		16 0	4 2	1 3	1909	Salem, Ohio
A	do		14 0	4 0	1 4	1907	Chester, Pa
B	do		14 0	4 0	1 4	1907	do
No. 1	Canoe		17 0	0 34	0 14		Veazie, Me

WHEELING, W. VA.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Addison	180-ton dipper dredge	177.00	75 0	30 0	7 2	1880	On Kanawha River.
U. S. E. D. Wheeling, Rosecrans.	Sand digger	176.00	111 0	22 0	5 0	1907	Dam No. 3, Ohio River.
L. C. Wolfe	Bucket dredge	114.00	60 6	32 6	4 7		Pittsburgh, Pa
U. S. E. D. Wheeling, No. 2.	Combination derrick boat and dredge.	130.00	70 6	32 0	4 0		do
U. S. E. D. Wheeling, No. 3.	Combination derrick boat, pile driver, and dredge.[3]	95.00	70 6	30 7	4 6		do
U. S. E. D. Wheeling, No. 24.	Combination derrick boat and dredge.	161.00	75 0	35 0	4 10	1910	Dam No. 26, Ohio River.
Captain Turtle	80-ton snag boat	75.00	65 0	30 0	4 6	1910	Marietta, Ohio
James Rumsey	130-ton towboat	127.00	120 0	22 0	4 3	1903	Charleston, W. Va
Loma	Tow and survey boat (paddle).	31.00	83 0	15 7	4 7	1899	Cincinnati, Ohio
Mascot	Steam launch	7.00	61 0	8 0	3 7	1803	Charleston, W. Va
Sergeant Burke	Gasoline launch	5.00	35 0	8 6	3 6	1910	Bay City, Mich
U. S. E. D. Wheeling, No. 10.	Maneuver boat	60.00	60 0	22 0	3 8	1909	Elizabeth, Pa
U. S. E. D. Wheeling, No. 11.	do	60.00	60 0	22 0	3 8	1909	do
U. S. E. D. Wheeling, No. 22.	do	60.00	60 0	22 0	3 8½	1910	Freedom, Pa
U. S. E. D. Wheeling, No. 23.	do	60.00	60 0	22 0	3 8¼	1910	do

[1] Unknown.

[2] Canvas covered.

[3] Hull and cabin rebuilt and remodeled.

employed in the Engineer Department at Large on June 30, 1911—Continued.

WASHINGTON, D. C.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1894	West Point, Va.	Wood.	$35.00	$3.00	Bad...	Rappahannock River.	Improving Rappahannock River, Va.
1897	Washington, D. C.	...do...	30.00	5.00	Fair...	James River, Va	Improving James River, Va.
1898	.....do..........	...do...	18.00	2.00	Bad...	York River, Va..	Improving York River, Va.
1898	Baltimore, Md..	...do...	50.00	15.00	Fair...	James River, Va.	Improving James River, Va.
1902	Washington, D. C.	...do...	45.00	15.00	Good..	York River, Va..	Improving York River, Va.
......	....	...do...	Unknown.	25.00	...do...	Potomac River...	Improving Potomac River.
1903	Washington, D. C.	...do...	80.00	20.00	...do...	.....do..........	Do.
1904	.....do..........	...do...	27.50	15.00	Fair...	.....do..........	Do.
1904	.....do..........	Iron...	23.50	10.00	...do...	.....do..........	Do.
1904	.....do..........	Wood.	45.00	15.00	Good..	.....do..........	Do.
1906	Boston, Mass....	...do...	Unknown.	30.00	...do...	James River, Va.	Improving James River, Va.
1906	.....do..........	...do...	Unknown.	30.00	...do...	.....do..........	Do.
1907	Washington, D. C.	...do...	58.00	20.00	...do...	Potomac River...	Improving Potomac River.
......	....	...do...	60.50	60.50	...do...	James River, Va.	Improving James River, Va.
......	....	...do...	63.75	63.75	.do...	.....do..........	Do.
......	....	...do...	64.25	64.25	...do...	.....do..........	Do.
......	....	...do...	58.00	58.00	...do...	.....do..........	Do.
1909	Salem, Ohio.....	Steel..	45.00	30.00	Fair...	Fort Washington, Md.	Preservation and repair of fortifications.
1907	Chester, Pa.....	Wood.	39.00	15.00	Good..	Dalecarlia Reservoir.	Washington Aqueduct, D. C.
1907	.....do..........	...do...	39.00	15.00	...do...	.....do..........	Do.
1911	Washington, D.C.	...do.[5].	35.00	35.00	...do...	Occoquan Creek, etc.	River and harbor works.

WHEELING, W. VA.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
......	....	Wood.	$12,000.00	$14,000.00	Good[5]	Kanawha River, W. Va.	Kanawha River improvement.
1910	Dam No. 26, Ohio River.	...do..	[4] 12,000.00	11,000.00	...do..	Dam No. 26, Ohio River.	Ohio River improvement.
1908	Pittsburgh, Pa..	...do..	[4] 4,000.00	4,500.00	...do..	.....do..........	Do.
1908	Parkersburg, W. Va.	...do..	[4] 3,200.00	3,000.00	...do..	.....do..........	Do.
1908	.....do..........	...do..	[4] 2,000.00	2,300.00	...do..	.....do..........	Do.
.....	....	...do..	7,437.45	10,000.00	...do..	.....do..........	Do.
1910	Marietta, Ohio..	...do..	8,200.00	8,200.00	New..	Kanawha River, W. Va.	Kanawha River improvement.
1903	Charleston, W. Va.	Steel..	28,000.00	24,000.00	Good..	.....do..........	Do.
1906	Pittsburgh, Pa..	Wood.	5,000.00	5,500.00	...do..	Dam No. 26, Ohio River.	Little Kanawha River improvement.
1893	Charleston, W. Va.	Steel..	4,650.00	125.00	Worthless.	.....do..........	Kanawha River improvement.
1910	Bay City, Mich..	Wood.	1,980.00	1,980.00	New..	.....do..........	Ohio River improvement.
1909	Pittsburgh, Pa..	...do..	5,629.00	5,400.00	Good..	Dam No. 13, Ohio River.	Do.
1909	.....do..........	...do..	6,200.00	6,000.00	...do..	Dam No. 18, Ohio River.	Do.
1910	.....do..........	...do..	5,200.00	5,000.00	...do..	Dam No. 11, Ohio River.	Do.
1910	.....do..........	...do..	5,200.00	5,000.00	...do..	Dam No. 26, Ohio River.	Do.

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[4] Second hand.

[5] This boat is being equipped for operating a ½-yard bucket.

TABLE VI.—*Statement of floating plant owned by the United States and*

WHEELING, W. VA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.						Built.	
			Length.		Beam.		Depth.		When.	Where.
		Tons.	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*		
No. 26	100-ton dump boat (side).	32.00	58	0	20	0	5	9	1902	Middleport, Ohio
No. 27	do	32.00	58	0	20	0	5	9	1906	Point Pleasant, W. Va.
No. 28	35-ton quarter boat	30.00	65	0	20	0	3	9	1910	Marietta, Ohio
No. 21	65-ton crane boat (flat deck).	45.00	80	0	22	0	3	4	1899	Charleston, W. Va.
U. S. E. D. Wheeling, No. 16.	Flatboat	40.00	90	0	16	0	4	7	1910	Dam. No. 26, Ohio River.
U. S. E. D. Wheeling, No. 17.	do	40.00	90	0	16	0	4	7	1910	do
U. S. E. D. Wheeling, No. 18.	do	40.00	90	0	16	0	4	7	1910	do
U. S. E. D. Wheeling, No. 20.	do	66.00	90	0	16	0	5	9		
U. S. E. D. Wheeling, No. 21.	do	66.00	90	0	16	0	5	9		
U. S. E. D. Wheeling, No. 25.	do	28.00	75	0	16	0	4	1	1911	Dam No. 26, Ohio River.
U. S. E. D. Wheeling, No. 26.	do	28.00	75	0	16	0	4	1	1911	do
U. S. E. D. Wheeling, No. 1.	do	40.00	90	0	16	0	4	7		
U. S. E. D. Wheeling, No. 4.	do	55.00	60	8	32	6	5	0		
U. S. E. D. Wheeling, No. 5.	Flaboat (decked)	47.00	85	0	20	0	4	6		
U. S. E. D. Wheeling, No. 7.	Flatboat	36.00	90	0	16	0	4	4	1909	Dam No. 26, Ohio River.
U. S. E. D. Wheeling, No. 8.	Flatboat (decked)	28.00	75	0	16	0	3	10	1909	do
U. S. E. D. Wheeling, No. 9.	do	28.00	75	0	16	0	3	10	1909	do
U. S. E. D. Wheeling No. 12.	Flatboat	2.00	30	0	10	0	1	0		
U. S. E. D. Wheeling No. 15.	do	40.00	90	0	16	0	4	7	1910	Dam No. 26, Ohio River.
No. 24	Flatboat (decked)	27.00	70	0	16	0	3	4	1895	Charlestown, W. Va.
No. 25	Flatboat	27.00	80	0	18	0	3	4	1900	Middleport, Ohio
L. K. No. 1	do		30	0	7	0	2	0	1908	Burnsville, W. Va.
L. K. No. 3	Flatboat (80-ton decked barge).	80.00	88	0	19	6	4	0	1905	Point Pleasant, W. Va.
L. K. No. 4	do		60	0	8	0	1	8	1907	do
L. K. No. 5	do		56	0	7	0	1	8	1907	do
L. K. No. 6	do		48	0	8	0	1	8	1907	do
U. S. E. D. Wheeling No. 19.	do		41	9	14	0	3	0	1910	Dam No. 13, Ohio River.
4 A 2	30-ton derrick service boat.	27.00	59	0	20	0	2	4½	1908	Charleston, W. Va.
5 A	25-ton derrick service boat.	20.00	50	0	20	0	2	4½	1901	Middleport, Ohio
6 A 2	30-ton derrick service boat.	24.00	59	0	20	0	2	4½	1907	Charleston, W. Va.
7 A	25-ton derrick service boat.	25.00	50	0	20	0	2	4½	1901	Middleport, Ohio
7 A 2	30-ton derrick service boat.	27.00	59	0	20	0	2	4½	1911	Charleston, W. Va.
8 A 2	do	29.00	59	0	20	0	2	4½	1902	Middleport, Ohio
9 A 2	do	29.00	59	0	20	0	2	4½	1906	Charleston, W. Va.
10 A 2	do	28.00	59	0	20	0	2	4½	1905	do
11 A 2	do	28.00	59	0	20	0	2	4½	1905	do
2 B 2	6-ton service boat	5.00	40	0	7	4	2	1½	1908	do
3 B 2	do	5.00	40	0	7	4	2	1½	1908	do
4 B 2	do	5.00	40	0	7	4	2	1½	1908	do
7 B 2	do	5.00	40	0	7	4		1	1910	Lock No. 7, Kanawha River.

[1] Second hand.

employed in the Engineer Department at Large on June 30, 1911—Continued.

WHEELING, W. VA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1902	Middleport, Ohio.	Wood.	$2,250.00	$600.00	Fair...	Kanawha River, W. Va.	Kanawha River improvement.
1906	Point Pleasant, W. Va.	...do..	1,850.00	1,100.00	Good..	...do..........	Do.
1910	Marietta, Ohio..	...do..	2,000.00	2.000.00	New..	.....do......	Do.
1899	Charleston, W. Va.	...do..	1.250.00	50.00	Worthless.	.....do..........	Do.
......	....	...do..	1,000.00	800.00	Good..	Dam No. 26, Ohio	Ohio River improvement.
......	....	...do..	1,000.00	800.00	..do..	.....do..........	Do.
......	....	...do..	1,000.00	800.00	..do..	.....do..........	Do.
1910	Dam No. 26, Ohio River.	...do..	[1] 500.00	400.00	..do..	.....do..........	Do.
1910	.....do..........	...do..	[1] 500.00	400.00	..do..	.....do..........	Do.
......	....	...do..	845.39	800.00	New..	.....do..........	Do.
......	....	...do..	845.39	800.00	..do ..	.....do	Do.
1909	Parkersburg, W. Va.	...do..	[1] 100.00	50.00	Worthless.	.....do.....	Do.
1903	.....do..........	...do..	[1] 900.00	400.00	Fair...	.....do..........	Do.
1908	.....do..........	...do..	[1] 750.00	400.00	..do..	.....do..........	Do.
......	....	...do..	799.00	600.00	Good..	.....do..........	Do.
......	....	...do..	654.00	500.00	..do..	.....do..........	Do.
......	....	...do .	654.00	500.00	..do..	.....do..........	Do.
1906	Parkersburg, W. Va.	...do...	[1] 15.00	10.00	Fair...	.....do..........	Do.
......	....	...do...	1,000.00	800.00	Good..	.....do..........	Do.
1895	Charleston, W. Va.	...do...	445.00	50.00	Worthless.	Kanawha River, W. Va.	Kanawha River improvement.
1900	Middleport, Ohio	...do...	825.00	200.00	Poor..	...do..........	Do.
1903	Burnsville, W. Va.	...do...	65.00	30.00	Good..	Dam No. 18, Ohio River.	Little Kanawha River improvement.
1907	Point Pleasant, W. Va.	...do...	700.00	300.00	..do...	Little Kanawha River, W. Va.	Do.
1909	Stouts Mills, W. Va.	...do...	[1] 210.00	25.00	Poor..	.....do..........	Do.
1909	.....do..........	...do...	[1] 140.00	100.00	Good..	.....do..........	Do.
1909	.....do..........	...do...	[1] 140.00	100.00	..do...	.....do..........	Do.
......	....	...do...	400.00	375.00	..do...	Dam No. 13, Ohio River.	Ohio River improvement.
1908	Charleston, W. Va.	...do...	900.00	700.00	..do...	Kanawha River, W. Va.	Kanawha River improvement.
1901	Middleport, Ohio	...do...	575.00	100.00	Poor..	.....do..........	Do.
1907	Charleston, W. Va.	...do...	750.00	600.00	Good..	.....do..........	Do.
1901	Middleport, Ohio	...do...	575.00	25.00	Worthless.	.....do..........	Do.
1911	Charleston, W. Va.	...do...	920.00	920.00	New..	.....do..........	Do.
1902	Middleport, Ohio	...do...	650.00	25.00	Worthless.	.....do..........	Do.
1908	Charleston, W. Va.	...do...	900.00	700.00	Good..	.....do..........	Do.
1905	.....do..........	...do...	700.00	400.00	..do...	.....do..........	Do.
1905	.....do..........	...do...	700.00	400.00	..do...	.....do..........	Do.
1908	.....do..........	...do...	200.00	160.00	..do...	.....do..........	Do.
1908	.....do..........	...do...	200.00	160.00	..do...	.....do..........	Do.
1903	.....do..........	...do...	190.00	50.00	Fair...	.....do..........	Do.
1910	....	...do...	106.00	100.00	Good..	.....do..........	Do.

TABLE VI.—*Statement of floating plant owned by the United States and*

WHEELING, W. VA.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
8 B 2	6-ton service boat	5.00	40 0	7 4	2 1	1910	Lock No. 8, Kanawha River.
9 B	do	5.00	40 0	7 4	2 1	1898	Montgomery, W. Va.
10 B 2	do	5.00	40 0	7 4	2 0	1909	Lock No. 10, Kanawha River.
11 B 2	do	5.00	40 0	7 4	2 1	1910	Lock No. 11, Kanawha River.
5 B 2	6-ton push boat	5.00	40 0	7 4	2 1¼	1902	Middleport, Ohio
6 B	do	5.00	40 0	7 4	2 1¼	1902	do

WILMINGTON, DEL.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Gannet	Gasoline cruiser (survey or inspection boat).	35.00	72 0	12 6	4 7	1907	Quincy Point, Mass.
No. 1	Launch (power tender)		14 0	4 0	2 6		
Hinda	Gasoline launch	5.00	28 0	7 6	2 3	1907	Morris Heights, N.Y.

WILMINGTON, N. C.

Name or number.	Class and description.	Displacement.	Length.	Beam.	Depth.	When.	Where.
Cape Fear	Seagoing hopper dredge.	480.00	113 9	29 0	12 0	1895	Philadelphia, Pa
Comstock, Gen. C. B.	do	1,100.00	165 0	36 6	16 0	1895	Perth Amboy, N. J.
Jacksonville	Hydraulic pipe-line dredge.	900.00	138 0	40 0	9 5	1904	Jacksonville, Fla.
Ajax	Clamshell dredge	400.00	82 0	32 8	10 4	1884	Port Royal, S. C.
Hercules	do	670.00	100 0	38 0	11 4	1907	Jersey City, N. J.
Scuppernong	do	220.00	78 0	32 0	7 0	1904	Newbern, N. C.
Trent	Snagboat	120.00	70 0	20 0	5 0	1899	do
Wright, Gen. H. G	do	130.00	89 0	23 0	5 6	[3]1882	Wilmington, N. C.
Caswell, Richard	Tugboat	200.00	74 6	18 6	10 0	1900	Baltimore, Md
Coquet	do	120.00	54 0	18 6	7 0	1906	Madison, Md
Cynthia	do	135.00	68 0	17 0	7 10	1891	Baltimore, Md
Mercur[4]	Steam launch	60.00	74 9	13 3	7 0	1892	New York, N. Y.

[1] Repaired.

[2] Purchased as part of equipment of Gannet.

employed in the Engineer Department at Large on June 30, 1911—Continued.

WHEELING, W. VA.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1910	....	Wood.	$105.00	$100.00	Good..	Kanawha River, W. Va.	Kanawha River improvement.
1898	Montgomery, W. Va.	...do...	107.00	25.00	Fair[1].	.....do...........	Do.
1909	....	...do...	117.00	100.00	Good..	.....do...........	Do.
1910	....	...do...	110.00	100.00	...do...	.....do...........	Do.
1902	Middleport, Ohio	...do...	175.00	40.00	Fair ..	.....do...........	Do.
1903	.....do...........	...do...	175.00	40.00	...do...	.....do...........	Do.

WILMINGTON, DEL.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
1910	Wilmington, Del.	Wood.	$11,000.00	$11,500.00	Good..	Wilmington, Del.	River and harbor improvements in Wilmington, Del., district.
......	(2)................	...do...	....	150.00	...do...	.....do...........	Do.
1907	Wilmington, Del.	...do...	2,600.00	2,300.00	...do...	Cold Spring Inlet, N. J.	Improving Cold Spring Inlet, N. J.

WILMINGTON, N. C.

When.	Where.	Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
......	....	Wood.	$60,809.30	$42,000.00	Fair...	Cape Fear River, N. C.	Improving Cape Fear River, N.C., at and below Wilmington.
......	....	...do...	86,000.00	70,000.00	Good..	.....do...........	Improving harbor at Galveston, Tex.
......	....	...do...	125,000.00	70,000.00	Ordinary.	.....do...........	Improving St. Johns River, Fla.
1897	Charleston, S. C.	...do...	16,050.00	16,500.00	Fair...	.....do...........	Improving Cape Fear River, N.C., at and below Wilmington.
1907	Jersey City, N. J.	...do...	61,350.00	51,000.00	Good..	.....do...........	Do.
......	....	...do...	10,300.00	8,000.00	Fair...	Newbern, N. C. subdistrict.	Various river and harbor improvements, Newbern, N.C., subdistrict.
......	....	...do...	8,500.00	3,000.00	...do...	.....do...........	Improving Neuse and Trent Rivers, Pamlico and Tar Rivers, Fishing Creek (3 appropriations).
......	....	...do...	3,000.00	5,000.00	Good..	Cape Fear River, N. C.	Improving Northeast, Black, and Cape Fear Rivers, N. C.
......	....	Steel..	26,500.00	22,000.00	...do...	.....do...........	Improving Cape Fear River, N.C., at and below Wilmington.
1907	Baltimore, Md..	Wood.	8,000.00	6,500.00	...do...	Newbern, N. C., subdistrict.	Various river and harbor works, Wilmington, N. C., district.
1897	Charleston, S. C.	...do...	8,500.00	17,000.00	...do...	Cape Fear River, N. C.	Improving Cape Fear River, N.C., at and below Wilmington.
1899	New York, N. Y.	Steel..	11,000.00	8,000.00	...do...	.....do...........	Do.

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[3] Rebuilt 1895 at Wilmington, N. C.

[4] Formerly the "Mary Lilly."

TABLE VI.—*Statement of floating plant owned by the United States and*

WILMINGTON, N. C.—Continued.

Name or number.	Class and description.	Displacement.	Dimensions.			Built.	
			Length.	Beam.	Depth.	When.	Where.
		Tons.	*Ft. in.*	*Ft. in.*	*Ft. in.*		
Frances	Gasoline launch	7.00	33 0	7 0	3 0	1906	Muskegon, Mich
Olive	do	7.00	30 2	6 2	2 0	1892	Morris Heights, N.Y.
Nancy	do	7.75	30 0	6 5	2 0	1903	New York, N. Y
Polly	do	2.00	16 0	4 6	2 6	1898	Derby, Conn
Spry	do	2.00	16 0	5 4	3 8		
Sunshine	Sharpie	12.00	48 0	12 0	3 0	1889	Smyrna, N. C
Lilliput	Floating hoister	82.00	60 0	24 0	5 1	1903	Wilmington, N. C
Black	do	51.00	45 0	20 0	3 9	1910	do
Scow B	Dump scow	125.00	84 8	26 0	10 3	1897	do
Scows D and E	do	135.00	91 8	26 0	10 0	1907	Jacksonville, Fla
Scows F and G	do	225.00	125 0	32 0	10 0	1908	Baltimore, Md
Scows J and K	do	108.00	83 0	24 0	7 0	1904	Newbern, N. C
Scow C	Decked scow	130.00	84 8	26 0	10 3	1897	Wilmington, N. C
Scow 1	Decked lighter	60.00	75 0	20 0	5 0	1895	do
Scow 2	do	60.00	75 0	20 0	5 0	1896	do
Scow 3	do	65.00	75 8	20 0	5 6	1903	do
Scow 4	do	65.00	75 8	20 0	5 6	1903	do
Scows 5 and 6	do	65.00	75 8	20 6	5 6	1907	do

[1] For 2.

employed in the Engineer Department at Large on June 30, 1911—Continued.

WILMINGTON, N. C.—Continued.

Purchased.		Material.	First cost.	Estimated value.	Condition.	Where employed.	Work to which belonging.
When.	Where.						
1908	Beaufort, N. C.	Wood.	$600.00	$2,000.00	Fair	Newbern, N. C., subdistrict.	Various river and harbor appropriations, Newbern subdistrict.
1905	Wilmington, N. C.	...do...	1,700.00	1,000.00	...do...	Cape Fear River, N. C.	Do.
		...do...	2,065.25	1,500.00	...do...	.....do	Improving Cape Fear River, N. C., at and below Wilmington.
		...do...	550.00	100.00	Ordinary.	.....do	Gun and mortar batteries.
		...do...		100.00	Fair	.....do	Improving harbor at Galveston, Tex.
		...do...	4,000.00	700.00	...do...	Newbern, N. C., subdistrict.	Various river and harbor works, Newbern, N. C., subdistrict.
		...do...	1,485.00	900.00	...do...	Cape Fear River, N. C.	Improving Cape Fear River, N. C., at and below Wilmington.
		...do...	1,300.00	1,200.00	Good	Northeast and Black Rivers, N. C.	Improving Northeast, Black, and Cape Fear Rivers, N. C.
		...do...	6,380.00	100.00	Poor	Cape Fear River, N. C.	Improving Cape Fear River, N. C., at and below Wilmington.
		...do...	[1] 16,500.00	10,000.00	Fair	.....do	Do.
		...do...	[1] 30,650.00	20,000.00	...do...	.....do	Do.
		...do...	[1] 3,500.00	3,500.00	...do...	Newbern, N. C., subdistrict.	Improving Pamlico and Tar Rivers, N. C.
		...do...	5,620.00	2,000.00	Good	Cape Fear River, N. C.	Improving Cape Fear River, N. C., at and below Wilmington.
		...do...	1,000.00	600.00	Poor	.....do	Do.
		...do...	1,000.00	400.00	...do...	.....do	Do.
		...do...	1,485.00	1,000.00	Fair	.....do	Do.
		...do...	1,485.00	800.00	...do...	.....do	Do.
		...do...	[1] 4,450.00	3,200.00	Good	.....do	Do.

APPENDIX A A A.

SUPERVISION OF THE HARBOR OF NEW YORK.

REPORT OF CAPT. C. McR. WINSLOW, U. S. NAVY, SUPERVISOR, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

WAR DEPARTMENT,
OFFICE OF SUPERVISOR OF HARBOR OF NEW YORK,
New York, July 19, 1911.

SIR: I have the honor to submit herewith the following report of the operations of this office for the fiscal year ending June 30, 1911, together with an estimate of funds required for the fiscal year ending June 30, 1913.

In making up the report it has been found necessary to go further into details than is usual in such reports, in order that the work accomplished and that yet to be done, together with the requirements of this office in enforcing the acts of Congress under which it operates, may be clearly stated.

The main object of the office is the protection of the channels of the harbor and tributary waters from injury due to the deposit in these waters of any injurious and obstructive material in violation of law.

The office was created under act of Congress of June 29, 1888, its jurisdiction being legally defined as extending over the Hudson as far as Troy, over New York Bay and Harbor, including Newark Bay, Staten Island Sound, Passaic River, Raritan Bay, and the tributaries thereto, and over the whole of Long Island Sound, embracing that body of water locally known as Fishers Island Sound. Its functions and powers were extended by amendments to that act approved August 18, 1894. Further additional duties were conferred by section 2 of said act, requiring the main channels to be kept free from small craft engaged in fishing or dredging for shellfish, or in any way interfering with the safe navigation of these channels by ocean steamships and other vessels of deep draft. Its functions and powers were still further extended in enforcing section 8 of act of Congress approved May 28, 1908, as modified by act of Congress approved February 16, 1909, requiring certain boats or scows engaged in the transportation of dredgings or other waste materials to be equipped at all times with certain specified articles for the better protection of life and property.

The available force maintained for the purposes stated consists of six patrol vessels and one naphtha launch.

Four of the patrol vessels, viz: *Lamont*, *Cerberus*, *Scout*, and *Nimrod*, have been docked and overhauled to the extent of funds available. The *Cerberus* and *Lamont* are now in good serviceable condition and are suitable for the work required, while the *Nimrod* and *Scout* are in fair serviceable condition but unsuitable for sea service in rough weather, the former because of her age, low freeboard, and deterioration from long service, and the latter on account of her type and small displacement. These two vessels were procured at a time when the tows were not required to deposit their cargoes as far out at sea, and it is necessary for their masters to avoid unduly risking their vessels in heavy seas. It is very desirable that larger and therefore more seaworthy vessels be provided for the outside patrol. These four vessels are employed in maintaining a permanent patrol, night and day, of the bay and harbor, extending to 5 miles outside the Scotland and Ambrose light vessels, to insure the deposit of material well outside the harbor at the points designated on the permits issued by this office, to prevent the deposit of stone and other ballast from incoming vessels at any point north of the light vessels, and to enforce the provisions of section 2 of the river and harbor act of August 18, 1894, as above quoted. One of these patrol vessels is stationed outside in the vicinity of the lightships, and another inside the Narrows. The inside patrol vessel collects the permits, stamping same with time and point of collection, notes thereon the condition of the tow passing out, and keeps the tows under surveillance as far as practicable until taken up by the patrol vessel on outside duty. The outside patrol vessel keeps the tows in view as far as practicable, until the designated point for deposit is reached and the material discharged; makes daily reports of all tows comprised of dumping scows containing cellar dirt, dredging spoils, or other waste material passing out for final disposition at sea, giving point and time of deposit and condition of loads before and after discharge.

In addition, this office is in receipt of a daily report from the Scotland light vessel, giving name of tug and number of dumpers comprising each tow passing the light vessel bound out.

Reports of loading, upon blank forms furnished by this office, are received daily from inspectors of dredging operations under Federal, State, and municipal contracts, also under many private contracts. These reports show location of dredging work, name or number and condition of each dumper loaded during the day, specifying the number of pockets loaded or empty in each dumper as the case may be, and are checked with the permits collected by the patrol vessels on inside duty, verified with the report of the vessel on the outside station. Discrepancies are thus noted and investigations made. Any dumper reported as loaded failing to pass out to sea is immediately checked and investigation instituted, contractors are notified and requested to furnish evidence for this office as to the legal disposition of the material so reported as having been loaded; failure in this particular results in such deductions as the department for whom the work is being done deems proper, or a reference of the case to the United States district attorney for such legal action as he may deem justified. Several cases of this character have been referred for the action of the United States district attorney during the past fiscal year. In these particular cases, the district attorney was of the opinion that a successful civil action under section 4 of the act of Congress of June 29, 1888, could be sustained to collect the fine imposed by said section of $5 for every cubic yard of dredging not deposited as required by said section, proceeding by way of libeling the dumpers employed in violation of the provisions of the act in the district court of the United States for such violation and for collection of the fine. As these are the first cases to be brought under a civil action since the establishment of this office, the issue is of much interest. Criminal proceeding under the act having been thoroughly established and strengthened by numerous trials of cases in the United States courts and judgment of that court affirmed by the United States Court of Appeals, the successful prosecution of a civil action under the act would materially strengthen the position of this office.

Dumpers failing to pass out in the same condition as reported by the inspector of dredging are noted, as are also dumpers failing to clear at the proper point of deposit, due to defective machinery or refractory material, and returning to the harbor with pockets loaded or partially loaded. Should they fail to be returned to the dredge in the condition reported, to be there measured and the contents deducted before reloading, and so stated on the next report of loading, the department or party furnishing the loading report is advised of the facts by this office and the suggestion made that payment therefor be withheld until satisfactory evidence or explanation has been furnished. This removes entirely any advantage which might accrue to the contractors by the escape or loss of material in transit. Such action is most salutary in its effects, as contractors find it materially to their interests to keep their plants in efficient and serviceable condition rather than suffer the deductions likely to result from leaky doors or defective machinery.

Under the foregoing described system of checking the following table shows deductions made on contracts for material escaping from dumpers while in transit or otherwise improperly disposed of or unaccounted for during the past fiscal year:

	Cubic yards.
United States Engineer Department	6,706
Department of docks and ferries, city of New York	1,277
United States Navy Department	450
Total	8,433

at an estimated average of $0.35 per cubic yard, $2,951.55.

Under contracts with above-noted departments 188 pocket loads, averaging 150 cubic yards each, or a total of 28,200 cubic yards, or approximately 47 scow loads, were checked upon reports of the patrol vessels as failing to clear at the proper point outside the lightship and were kept under surveillance until returned to the point of loading, to be there measured before reloading. The disposal of this amount of material would have caused injury to the channels and would have proven a large item of gain to the contractors could it have been disposed of on the way in without the knowledge of this office and before reaching the supervision of the parties for whom the work was being done. The contractor not only has to bear the expense of retowing it to sea, amounting to about $50 per scow, but frequently has to redredge it before being able to properly dispose of it.

From the foregoing detailed statement it will be apparent that the transportation and final disposition of this, the largest class of material, is well covered, and loss of material while in transit, or violations of law, can not well take place without the knowledge of this office.

There is still, however, a large amount of material technically known as cellar dirt, consisting of débris from razed buildings and excavations on shore, towed upon the waters for final disposition at the mouth of the harbor, which can not be reached by this system of checking, due to the fact that the contractors are dependent upon lessees of the water-front dumps and the scows to dispose of their material at so much per cartload, and there is no legal means of getting from these lessees reports of loading. Consequently such operations necessitate frequent inspections to keep track of the conditions of the dumpers at the various dumping boards. This duty devolves upon the patrol vessel *Vigilant*, whose master is required to make daily reports of the dumpers at each slip, giving time of inspection, condition of load, whether light, partial, or full. These reports are checked off with the permits collected and returned by the patrol vessels, discrepancies are noted and case investigated, and such action taken as is deemed best to insure compliance with law. In the event of any pockets failing to clear at the proper point of deposit at sea the patrol vessels on duty are required to keep such tows under surveillance until the loaded or partially loaded dumper has been returned to her slip.

In all cases where the checking system of loaded and empty dumpers is inapplicable or can not be fully enforced, special efforts are made to the extent of the available force for frequent inspections to insure the enforcement of law. The *Vigilant* is used for such special inspections along East and North River water fronts, Long Island Sound, and such other points within the jurisdiction of the office where extensive operations of dredging or excavating are underway. The services required of this vessel are many and continuous, and it is therefore important that her efficient serviceable condition be maintained. She is now under contract for the renewal of her engines and boilers, under the allotment of $15,000 authorized for that purpose for the fiscal year just closed. It was found extremely difficult to get suitable engines and boilers for this class of vessel within the limited amount authorized, due to the large increase in cost of material and labor since the first estimate was made some four years ago; but after much data had been collected and investigated, a contract was negotiated by which she will be fitted with two Badenhausen boilers and a triple expansion engine built by the New York Shipbuilding Co. With this new equipment she will doubtless prove an efficient and serviceable patrol vessel for many years.

The patrol vessel *Argus* is very old, being the first vessel procured for this service. She was probably suitable for the requirements of the service at that time, when all deposits, including the garbage from the city, were made in Coney Island Channel. With the change of the location of the dumping ground to about 10 miles farther seaward, increased danger from rough weather necessitated the employment of seagoing vessels. The *Argus* was therefore employed on inside work only. She was, however, kept on this duty by much patching and repairing until replaced by a new vessel in 1900, since which date she has been utilized as a spare boat, laid up under the care of a ship keeper, to take the place of any vessel of the permanent patrol which may have broken down or while under repair; such service from the *Argus*, however, is absolutely unreliable, is but a makeshift at best, and gives little or no return for the amount demanded in patch repairs. She was built of iron in 1886; in 1891 her plating was practically worn out, necessitating the sheathing of the hull with wood; her engine was replaced with a discarded Wells balance engine from the lighthouse vessel *Rose* in 1895 and is now almost useless. Although but a small sum may be expected from the sale, I am of the opinion that it would prove advantageous and economical to the United States to dispose of this vessel to the highest bidder under sealed proposals, as she is not worth repairing.

I urgently recommend that an allotment of $65,000, as included in my estimate of funds needed for the fiscal year 1913, for the purchase or construction of a new vessel for this service may be allowed. Such a vessel, if appropriated for, would not be available for at least 18 months, and by that time a boat to replace the *Nimrod* for outside sea duty will be imperative, as both hull and motive power of that vessel will have reached such a state of deterioration through long service as to entirely unfit her for patrol duty at sea. The services of this vessel ought to be confined to the limits of the harbor or those of Long Island Sound, for which duty she would probably be serviceable for some years to come. The New York State law prohibits the deposit of any material in the Sound west of Eaton's Neck light; thus the final disposition of material from along the north and south shores of New York above Hell Gate must necessarily be made to the eastward of that point. To require the deposit of material from these points to be made at sea, outside the Scotland lightship, would, because of the long towage and dangers of Hell Gate, prove a hardship and unnecessarily hamper development or improvement. As the supervision over deposits in Long Island Sound can only be spasmodic with the present available force, the necessity for a vessel to cover that district is becoming yearly more and more urgent, owing to the increase in improvement operations along Connecticut and Long Island shores.

The naphtha launch *Lookout* is in fair serviceable condition and renders much valuable service in patrolling the Kills, Newark Bay, Passaic River, and various shallow tributaries. This little vessel is also very useful in investigating points along shore where pier building or excavating operations are under way, or in special investigations where the water is insufficient for the larger vessels.

All the vessels of this service are becoming old, and it is only a question of time when the allotment for their maintenance must be increased.

The present designated point at sea near the mouth of the harbor for depositing dredging spoils is 2 miles southeast of Scotland lightship, in not less than 12 fathoms of water. That for cellar dirt and other waste containing floatable matter 3 miles to the southward and eastward of Scotland lightship, while during the bathing season, from June 1 to September 30, these deposits are required to take place an additional mile from the lightship. Soundings are taken by the patrol vessels about every three months, the results so far showing no serious appreciable shoaling. Care is being taken to maintain sufficient water in this vicinity, and dumping at these points may probably be continued for some time without detriment. Eventually, however, the designated points for deposit must be farther to the south and east. When the contemplated dredging of Coney Island Channel to a depth and width sufficient for tows will have been completed, these tows will then use that channel almost exclusively and thereby relieve the main channels of the lower bay and be out of the track of the vessels of deep draft. The opening of this channel is much to be desired when it is considered that during the past fiscal year frequently as many as 18 tows have passed out through the main channels to the dumping grounds outside the lightship on one tide, returning empty to the harbor, thus making two distinct trips, one out and the other in, making 36 tows passing out and in, or 72 trips through these channels on the two tides. A tow consists of an average of two dumpers, with about 100 fathoms of hawser between the towboat and the first dumper and about 80 fathoms between that and the following dumper of the same tow, the whole covering a distance of about a quarter of a mile. The loaded vessels comprising the tow are frequently awash; for this reason it is particularly desirable that this class of traffic be diverted from the main channels.

The present dumping ground at the mouth of the harbor, as above stated, is considered to be far enough seaward to prevent the floating matter returning on the tide. This office is this summer in receipt of the usual number of complaints as to the unsatisfactory condition of the bathing beaches along the New Jersey and Long Island coasts, due to garbage and other floating débris being thrown up by the tide. The existing conditions complained of are now under investigation, and I am of the opinion that they are due to débris left alongshore by picnic parties, carried out by the tide, only to be washed up at some other point by the action of wind and tide. Much of it may also come from excursion steamers passing through Coney Island Channel or along the coast, being the refuse from lunches carried by passengers, and also from the deposit of refuse in the water and on the beaches from small hotels, restaurants, and lunch counters, which, while individually trifling, in the aggregate amounts to many tons. No permits have been issued for the dumping of garbage at the mouth of the harbor during the past fiscal year, the entire garbage from the city, approximately 241,645 cubic yards during that period, having been towed under permits issued by this office to Barren Island, Jamaica Bay, and there deposited on shore for cremation. Of the city ashes and sweepings, approximately 3,082,975 cubic yards, only about 120,225 cubic yards was deposited at the mouth of the harbor, and that only during the winter and spring months, when the plants under operation in filling in Rikers Island had temporarily suspended, owing to the ice formations and other causes; the balance, or about 2,962,750 cubic yards, was utilized in filling behind bulkheads at Rikers Island, Irvington on the Hudson, Flushing Creek, Long Island, and reclaiming land on Newark Meadows, N. J.

The city's waste, nevertheless, has been a fruitful source of trouble and complaint. Much débris is permitted to escape during the process of loading scows at the city dumping boards, which, together with the refuse and dock sweepings from the commercial wharves along the water front, create an unsightly and probably injurious and insanitary condition of the waters of the harbor, accumulating in patches and floating out and in with change of tide until caught by a favorable wind and driven out to sea, or, under similar conditions, scattered along the beaches of the summer resorts along the New

Jersey and Long Island coasts. In some instances this débris, constantly seen floating in the rivers and bay, collects in the many slips along the water front, remaining there for an indefinite period.

It is clear that to preserve the cleanly appearance of the harbor as little unsightly and injurious material should be permitted to be discharged into the water as possible, and some provision should be made for removing such material of the above nature as may have fallen into the water through negligence or been thrown there in violation of law. The methods of handling city refuse can be improved, and this escaping city refuse forms a large part of the matter seen floating about the harbor and the wharves, the existence of which causes many well-warranted complaints.

On my recommendation to the city authorities small boats have been supplied and stationed at the various discharging depots, but continuous service of these boats has not been enforced.

Following another recommendation from this office, a scow was fitted with bins for containing light material of the city refuse, the purpose being to prevent the scattering of this refuse by the wind and the rolling of the scow while in transit about the harbor to its destination. As the scow and bins were not properly designed, being regarded at the time as only tentative, the experiment was a failure. I am informed that the matter has been dropped by the city authorities.

In my opinion, the city should adopt the following remedial measures: The boat service at the various discharging depots should be rigidly maintained; light material, such as boxes, crates, barrels, and paper from the city refuse should be transported only in scows containing bins. A discharging basin should be established at Rikers Island, with proper inclosing gates, and no scow should be discharged except within this basin. If these three measures were made effective, there would remain to be collected only such material as would fall from commercial wharves and that small part of the city refuse which would unavoidably escape. A boat service maintained by the city should be established to clear up this last-mentioned part of the floating débris.

No valid objection can be offered to the above suggestions, nor can the resulting benefit be denied. It is hoped that the city authorities will comply with the recommendations of this office regarding these remedial measures.

Many logs and large timbers are permitted to get adrift from operations of bulkhead and pier extensions through carelessness or neglect or are washed offshore by freshets or tides and find their way to the upper and lower bays, floating out and in with each tide; and although every effort is made by the force of this office to trace their source, much difficulty is experienced in identification. It would, therefore, be of great advantage to the maritime interests of the port if this or other office had the authority and the necessary funds to establish a service by which such menaces to safe navigation could be secured immediately after being reported or discovered and towed to some point for disposition. In all cases where wharves or docks are under construction or where the removal of all old cribwork or spiles is involved this office keeps as strict a supervision over the work as its facilities will allow, requiring all contractors engaged on such work to remove on shore or raft such timbers. As these timbers consist chiefly of worthless foundation spiles and crib logs, great difficulty is experienced by the contractors in disposing of them, as the deposit of such material at the mouth of the harbor is absolutely forbidden by the regulations of this office. There is therefore much temptation to secure them with tender lines. Such points of operation demand special attention from the patrol service, and the contractor in all cases is required to secure such logs as may be brought to the surface, to be rafted and disposed of on shore. The available force is insufficient for an efficient night patrol of the water front. It is probable, therefore, that some of the rafted timbers part their lines and get adrift, and many violations of law are doubtless committed during that period.

During the past year attention has been directed to the disposition of ashes and rubbish from the numerous small steam craft plying the waters of the harbor, and the city authorities, under section 882 of the charter of Greater New York, cooperate with this office in so far as to maintain seven deck scows for the special use of vessels wishing to discharge ashes or rubbish. The location of these scows is designated by the supervisor at such points as may be most convenient and readily accessible. The facilities so furnished very considerably lessen the temptation for small craft to dispose of their refuse illegally. Violation of law in this respect is one of the hardest to detect. Experience teaches that it is useless to put much reliance on the inhabitants along shore or on persons employed on the water for evidence against lawbreakers, other than that of a general nature. Evidence of violation must, therefore, be furnished from the crews of patrol vessels or the force at the disposal of this office.

The established policy to designate dumping grounds as far seaward as may be consistent with reasonable safety encourages the utilization of waste material, particularly in reclaiming and enlarging Rikers Island, Governors Island, and the new freight terminals of the Pennsylvania Railroad at Harrison, N. J., while much of the dredging spoil arising through the deepening of the Passaic River is made use of on the swamp lands to the westward of Newark Bay.

During the summer months much dredging is going on along the Hudson River, Long Island Sound, in the kills and bays around Staten Island, and in many small inlets and creeks, and permits are issued for the final disposition of such dredging spoils either on shore above high-water mark, behind bulkheads, or at such points in the deep waters of the locality as may prove least injurious and may meet with the approval of the United States engineer officer in charge of the district. Any attempt made by this office to keep careful watch over all these operations with the present force would be futile.

Material dredged from Ambrose and other channels by the United States operating dredges under United States Army Engineer officers is deposited under their supervision in an average depth of 80 feet in the neighborhood of Scotland Lightship or such other point near the mouth of the harbor as may be deemed not detrimental to the harbor channels. The quantity so deposited during the past fiscal year amounted to 5,841,699 cubic yards. This amount, added to that deposited by private contractors engaged in public work in improvement along the water fronts of Manhattan, Brooklyn, and New Jersey, tunnel excavations and débris from excavations, amounting to 6,925,253 cubic yards, gives an aggregate amount of approximately 12,765,952 cubic yards deposited during the year at the mouth of the harbor. The transportation of this large amount of waste material over the waters of the harbor to the point for final disposition involves towing distances varying from 25 to 40 miles. To curtail the towing distance, thereby saving money, is a strong incentive for private contractors to dispose of the cargoes illegally, and emphasizes the necessity for the wise measures as passed by Congress for the protection of the channels. Any modification of the existing laws by which owners or contractors might evade responsibility would be inimical to the best interests of the Government and the commercial interests of the port.

Were it not for the patrol established under this office, the probable violations of law which would occur in the movement of vast quantities of material about the harbor and adjacent waters, averaging 20,000,000 cubic yards annually, and in the disposal of the many cubic yards of ashes and rubbish from ferryboats, steam vessels, and towboats, would undoubtedly cause a shoaling of the channels and approaches of the harbor which, if not dredged, would in a comparatively short time close the harbor to deep-draft vessels. The large sums expended by the Government in the improvement and maintenance of the channels, and the commercial importance of New York Harbor and tributary waters, warrant the maintenance of an efficient and seaworthy patrol fleet. It is preeminently an economical measure, and the service should be increased to adequately cope with the demands of the growing activity of the industries of the port.

The following is a synopsis of cases referred during the past fiscal year to the United States district attorneys for action, and of such cases settled or pending since the last annual report:

CASE AGAINST THE TUG "EDMUND MORAN."

A synopsis of this case appeared in the Annual Report of the Chief of Engineers for 1910, Appendix B B B, pages 2612 and 2613.

June 28, 1910: Indictment found against International Contracting Co., Moran Towing & Transportation Co., Thomas Reynolds, and Julius Anderson. All defendants except Anderson pleaded non vult. Sentence suspended. Nolle-pros entered as to Anderson. Another indictment was found against the Contracting Co., the Transportation Co., Thomas Reynolds, and one Christian Peterson, to which all the defendants pleaded non vult. The Moran Towing & Transportation Co. was fined $250, which was paid, and sentence was suspended as to other defendants. (C. 149.)

CASE AGAINST WILLIAM BEARD & CO.

In this case, during June, 1910, the contents of six dumpers loaded with dredging spoils from Bayonne, N. J., failed to pass to sea and there legally dispose of their contents at the designated dumping ground.

Civil action commenced against William Beard & Co. to recover the sum of $17,125. June 30, 1911: This action is now at issue. (C. 154.)

CASE AGAINST THE MORRIS & CUMINGS DREDGING CO.

Reports on file in this office showed that dumper *No. 46 M* was fully loaded with material dredged from Raritan Bay at 3.30 p. m., November 19, 1910, and *No. 42 M* at 5.30 p. m. of that date. *No. 42 M* was reported again as having been reloaded at that point about

4 p. m. of November 21 and *No. 46 M* at 7 p. m. November 22. Between the times specified, investigation showed that the above-mentioned dumpers had not been towed to sea and their contents legally disposed of at the designated dumping ground.

Civil action commenced against the Morris & Cumings Dredging Co. to recover the sum of $7,485.

June 30, 1911: This action now at issue. (C. 173.)

CASE AGAINST THE CAHILL TOWING LINE.

In this case the contents of six dumpers loaded with dredging spoils from Edgewater, N. J., failed to pass to sea and there legally dispose of their contents at the designated dumping grounds.

June 30, 1911: Case pending. (C. 176.)

CASE AGAINST THE CAHILL TOWING LINE—TUGS "ANNA W." AND "O. L. HALENBECK."

In this case the inside patrol vessel *Scout* inspected the tow of the tug *Anna W.* while passing the fort bound out about 5.10 p. m. of December 23, 1910, and found same to consist of dumpers *018* and *021* loaded with mud. This tow was again inspected by the patrol vessel on outside duty, *Lamont*, at a point about one-half mile inside the designated dumping ground at about 8.15 p. m. of that date, when dumper *018* was found to be empty, the contents of this dumper having evidently been illegally deposited in the channels of the harbor at some point between the fort and point of last inspection.

The patrol vessel *Scout* inspected the tow of the tug *O. L. Halenbeck* while passing the fort bound out about 6.20 p. m. of December 23, 1910, and found same to consist of dumpers *Nos. 10 S*, *20 S*, and *40 S*, all loaded with mud. This tow was again inspected by the patrol vessel on outside duty, *Lamont*, at a point about one-half mile inside the designated dumping ground about 10.15 p. m. of that date, when dumper *No. 20 S* was found to be empty, the contents of this dumper having evidently been illegally deposited in the channels of the harbor between the fort and point of last inspection.

June 30, 1911: Case pending. (C. 177.)

The following is a list of cases of violation of the act of Congress approved May 28, 1908, in relation to equipment required to be carried by scows or other vessels employed in the transportation of waste, which have been referred to the United States district attorney for his action during the past year, showing disposition in each case:

Date case was referred.	Name of scow.	Owner's name.	Disposition.
1910. Aug. 23	Emma	J. F. O'Brien	Arrested, arraigned, and discharged.
Do.	David	L. Gildersleeve	Do.
Do.	Clara	Chas. Erickson	Do.
Do.	K. Guinan	David Guinan	Held for action of grand jury.

During the fiscal year ending June 30, 1911, 20,451,546 cubic yards of material—mud, sand, city refuse, garbage, cellar dirt, ashes, lime, and other material—have been moved and deposited outside the harbor at properly designated places and behind bulkheads in the neighborhood of New York, as per the following recapitulation:

Place of deposit.	Kind of material.	Amount.
		Cubic yards.
Mouth of harbor, outside Scotland lightship.	Mud, sand, city refuse, etc	12,765,952
Long Island Sound	Mud, shells, etc	1,856,306
Fishers Island Sound	do	71,689
Hudson River	Sand and mud	88,423
Do	Mud, dirt, ashes, etc., behind bulkheads and on shore for filling.	308,039
East River	do	2,668,658
Harlem River	do	128,550
Passaic River	do	471,963
Shrewsbury River	do	148,226
Hackensack River	do	137,350
South River	do	27,295
Newark Bay	do	484,345
New York Bay	do	855,320
New York Bay (Central R. R. Co. of New Jersey, Port Liberty).	do	116,890
Raritan Bay	do	10,848
Staten Island Sound	do	70,047
Barren Island	Garbage, dead animals, etc., on shore for reduction	241,645
Total		20,451,546

Permits issued	8,665
Average number of tows daily to sea	18
Average number of scows daily to sea	36

From the foregoing statement it will be seen that 12,765,962 cubic yards of mud, street sweepings, cellar dirt, etc., was deposited near the mouth of the harbor; 1,856,306 cubic yards of dredging spoils deposited in Long Island Sound, a small percentage of which—principally sand and shells—was utilized for the propagation of oysters, being scattered over oyster beds under supervision of the Shell Fish Commission of the State of Connecticut; 71,689 cubic yards of mud, etc., deposited in Fishers Island Sound; 5,427,531 cubic yards of cellar dirt, ashes, and other inoffensive material was used for filling in behind bulkheads; and 241,645 cubic yards of garbage, dead animals, offal, etc., were deposited on Barren Island for reduction.

The following is a statement of the appropriation for "Prevention of Deposits, Harbor of New York, 1911":

For pay of inspectors, deputy inspectors, office force, and expenses of office		$10,260.00	
Expended to June 30, 1911	$10,125.07		
Outstanding liabilities	106.44		
		10,231.51	
			$28.49
For pay of crews and maintenance of 6 steam tugs and 1 launch		75,000.00	
Expended to June 30, 1911	$69,104.83		
Outstanding liabilities	5,865.27		
		74,970.10	
			29.90
For renewing engines and boilers in steam tug *Vigilant*		15,000.00	
Outstanding liabilities		14,613.00	
			387.00
Balance			445.39

The following is an estimate of appropriation required for service of the fiscal year ending June 30, 1913, by the supervisor of the harbor of New York:

Prevention of obstructive and injurious deposits within the harbor and adjacent waters of New York City.

Detailed objects of expenditure and explanations.	Estimated amount that will be required for each object.	Amount appropriated for fiscal year ending June 30, 1912.
For pay of inspectors, deputy inspectors, office force, and expenses of office	$10,260	$10,260
For pay of crews and maintenance of 6 patrol vessels and 1 launch	75,000	75,000
For purchase or construction of 1 patrol vessel	65,000	....
For rent of office space	3,000	....
Total	153,260	85,260

Very respectfully,

C. McR. Winslow,
Captain, United States Navy, Supervisor.

The Chief of Engineers, United States Army.

APPENDIX B B B.

ANNUAL REPORT OF THE CALIFORNIA DÉBRIS COMMISSION FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

CALIFORNIA DÉBRIS COMMISSION,
San Francisco, Cal., June 30, 1911.

SIR: The California Débris Commission has the honor to submit the following annual report for the fiscal year ending June 30,1911.

REGULATION OF HYDRAULIC MINING.

Under the provisions of the act of Congress approved March 1, 1893, as amended by the act approved February 27, 1907, the commission is charged with the duty of regulating hydraulic mining operations in the territory drained by the Sacramento and San Joaquin River systems, to the end that such mining operations may be carried on without injury to the navigability of said rivers or the lands adjacent thereto. A map of the lower portions of the Sacramento and San Joaquin rivers, showing tributary streams draining hydraulic mining districts was published at page 2492 of the Annual Report of the Chief of Engineers for 1881 (Part III).

During the past fiscal year the commission received 15 applications for permits to mine by the hydraulic process under the act of Congress referred to above.

During the same period three permits to mine by the hydraulic process were granted, the applicants in these cases having constructed the necessary dams or barriers to impound the débris resulting from their mining operations so as to prevent the débris from reaching the navigable streams.

A number of permits were revoked by the commission during the year, the miners in such cases having completed their mining operations, or abandoned them, or exhausted the facilities for impounding débris.

A number of permits were temporarily suspended by the commission during the year, the miners in such cases having temporarily suspended mining operations, or exhausted the existing impounding capacity of their dams or barriers for impounding débris.

Numerous personal inspections of mines and their works for impounding débris were made during the year.

Practically all the works now built by miners for impounding débris are concrete dams.

PLANS FOR IMPROVEMENT AND PORTECTION OF RIVERS AND CONTROL OF FLOOD WATERS AND MINE DÉBRIS.

Under the provisions of the act of Congress approved March 1, 1893, the commission is required to mature and adopt such plans from examinations and surveys already made, and from such additional examinations and surveys as may be deemed necessary, as will improve the navigability of all the streams comprising the Sacramento and San Joaquin River systems, deepen their channels, and protect their banks, such plans to be matured with the view of making the same effective as against the encroachment of and damage from débris resulting from mining operations, natural erosion, floods, and other causes.

Under these provisions of the act of Congress approved March 1, 1893, the commission submitted, under date of January 30, 1900, a project for impounding the enormous quantities of mine débris in the Yuba River and its tributaries, to prevent the débris from reaching the Feather and Sacramento Rivers below. This project was adopted by act of Congress approved June 13, 1902. The operations under this project during the past fiscal year are given in this report under the heading "Storage of Mine Débris in Yuba River, California."

Under the provisions of the act of Congress approved March 1, 1893, the commission submitted June 30, 1907, a preliminary report (printed in the Annual Report of the Chief of Engineers for 1907, pp. 2262–2269) on the subject of the control of mine débris, improving navigability, and the control of floods in the Sacramento and Feather Rivers, by means of dredging and levees. The general recommendations contained in this report were adopted by act of Congress approved June 25, 1910. The operations under this project during the past fiscal year are given in this report under the heading "General project for control of débris and floods in the Sacramento and Feather Rivers."

At the time the preliminary report of June 30, 1907, above referred to, was submitted and for several years prior thereto, the commission was engaged in making examinations and surveys of the Sacramento, Feather, Yuba, American, and Bear Rivers, and their tributaries, with the view of submitting, as required by the terms of the act of Congress approved March 1, 1893, a complete project on the subject of controlling mine débris, improving navigation and controlling floods generally in the Sacramento Valley and the adjacent San Joaquin Valley. The examinations and surveys were continued, and a general project for affording relief from floods in the valleys was submitted to the Chief of Engineers in September, 1910. (See H. Doc. No. 81, 62d Cong., 1st sess.) This plan provides for caring for the excess flood waters by means of a system of by-passes and weirs along portions of the Sacramento River, by straightening and widening the existing channel of that stream at places, by confining to their present channels by means of levees of flood waters of all the important tributary streams, and by collecting the hill drainage in intercepting canals and conveying it to the rivers or proposed by-passes at convenient points. The estimated total cost of the work included in the project was placed at $33,800,000. The work pro- [illegible] preliminary report of June 30, 1907 (printed in the

Annual Report of the Chief of Engineers for 1907, pp. 2262–2269), being a part of the work proposed in the general project submitted in September, 1910, and the United States and the legislature of the State of California having each appropriated $400,000 for the work outlined in the preliminary report of June 30, 1907, the estimated total cost of the work proposed in the general project submitted in September, 1910, $33,800,000, should be reduced by $800,000, leaving $33,000,000 as the balance of the estimated total cost remaining to be appropriated for the completion of the general project should the latter be adopted. In considering the question of the proper division of the expense of the work proposed in the general project, the commission mentioned two-thirds of the balance of $33,000,000 as the amount that should be contributed by the State of California, or $22,000,000, and one-third by the United States, or $11,000,000.

The commission has continued making minor surveys since the general project was submitted, in September, 1910, for the purpose of obtaining additional data needed in connection with that project, and in connection with the work of widening the Sacramento River near its mouth under the preliminary project of June 30, 1907, with the $800,000 appropriated by the United States and State of California.

Estimate of additional funds required.

Amount (estimated) required for expenses of California Débris Commission during the fiscal year ending June 30, 1913, in regulating hydraulic mining operations in the State of California, making examinations and surveys for improvement of navigation, control, and disposition of mine débris and control of flood waters, as required by the act of Congress approved Mar. 1, 1893	$15,000.00

STORAGE OF MINE DÉBRIS IN YUBA RIVER, CAL.

The project (printed in the Annual Report of the Chief of Engineers for 1900, Part 8, p. 5030) for the treatment of Yuba River provided for holding the great quantities of mine débris now in that stream and its numerous tributaries to prevent it from reaching the Feather and Sacramento Rivers, the débris to be held in the Yuba above the city of Marysville, Cal., by means of dams across the river, by a settling basin adjoining the river on the south, and by training walls below. Later on, as the result of experience had in constructing portions of the proposed dams across the river, the dams were eliminated from the project, as was also the settling basin, it being considered that future work under the project should be confined to the construction of the training walls. The expense of carrying on the work under this project is shared equally by the United States and the State of California, each having appropriated $400,000 for the purpose.

The operations under the Yuba River project during the past fiscal year have been as follows:

Training walls.—The work of constructing gravel embankments by means of gold dredges to confine and control the flow of Yuba River in the vicinity of Daguerre Point, about 10 miles above Marysville, under agreements with W. P. Hammon and associates, was continued during the year. Under the agreements referred to a total of approximately 16,700 linear feet of embankments are to be constructed, 300 feet wide on the base and 30 feet high at the highest places. Approximately 800 linear feet of embankment was constructed during the past fiscal year under the agreements with W. P. Hammon and associates, making a total of 15,400 feet of the total of 16,700 feet of these embankments completed to June 30, 1911. These embankments are being built for the United States and State of California in exchange for the right to extract gold from certain lands of the United States.

The work of strengthening the completed portion of the north training wall lying immediately below Daguerre Point, by means of additional parallel embankments, was completed during the past fiscal year by the Yuba Consolidated Gold Fields, a corporation, under a contract dated August 31, 1909. Five hundred and sixty feet of the embankment was strengthened during the past fiscal year at a cost of $6,301.86, one-half of which amount was paid by the United States and one-half by the State of California.

The work of constructing gravel embankments by means of gold dredges to confine and control the flow of Yuba River below Daguerre Point, under an agreement with John Martin (Marysville Gold Dredging Co. successor), has remained suspended throughout the past fiscal year. It is anticipated that work under this agreement will be resumed during the ensuing fiscal year, upon the completion of a new gold dredge by the company.

The total length of the embankments required to be built under this agreement is 10,000 feet, the width on the base being 300 feet, and the height 30 feet in the highest places. Approximately 5,200 feet of the embankments covered by this agreement has been completed. These embankments are being constructed for the United States and State of California in exchange for the right to extract gold from the gravel on the lands west of the old State dam and south of the south training wall.

The work of removing the trees and brush from the flood channel of Yuba River from Daguerre Point down to Marysville was begun October 3, and continued until November 30, 1910. This was done to secure a quick run-off of flood water, and thus protect the training walls below Daguerre Point. The work was done by hired labor. The crew consisted of 40 men. All the brush was cut at the surface of the ground and burned. The total area cleared of brush was 205.2 acres. The total cost of this work was $5,964.56, one-half of which amount was paid by the United States and one-half by the State of California.

Settling basin.—The act of Congress of June 25, 1910, contained the following provision:

> The Secretary of War is authorized, in his discretion, to sell the lands and other property acquired for the construction of the Yuba River settling basin, California, and to modify the project of the California Débris Commission for improving Sacramento and Feather Rivers accordingly; the proceeds of the sale to be applied to such modified project.

Pursuant to the above, the commission on July 28, 1910, recommended that the Yuba River project be modified so as to eliminate the proposed settling basin. This modification of the project was authorized by the War Department on August 13, 1910.

Under the above-quoted provisions of the act of June 25, 1910, the commission on July 28, 1910, also recommended the sale of all the right, title, and interest of the United States in and to approximately

1,818 acres of land, being a portion of the lands acquired for the purposes of the settling basin. The proposed sale was authorized by the War Department under date of August 13, 1910, it being stipulated that the sale should be made by competitive bids. A proposed advertisement, with specifications, inviting bids for the land was submitted for approval to the department on September 9, 1910. At the instance of former owners of some of the land to be sold, the right to sell the interest of the United States therein was questioned, one of the claims being made that the interest of the United States in the land should revert to the former owners should the proposed settling basin be abandoned or eliminated from the project. The War Department therefore directed, under date of November 18, 1910, that action looking to the sale of the lands should be deferred in order to enable the claimants to submit their case to Congress with a view to obtaining legislative relief. The claimants having in the meantime applied to Congress and failed to secure legislative relief, consideration of the proposed sale was resumed by the War Department in March, 1911. On April 22, 1911, the subject was referred to the Attorney General, with request for opinion upon the merits of the claims that had been made at the instance of the former owners. The opinion of the Attorney General, dated April 28, 1911, was against claimants. The Secretary of War thereafter directed, on May 10, 1911, that the sale should be proceeded with in accordance with the act of June 25, 1910. It is proposed to invite bids for the land shortly after July 1, 1911, giving prospective bidders and others interested ample notice of the proposed sale.

APPROPRIATIONS BY CONGRESS.[1]

June 3, 1896	$250,000.00
June 13, 1902	150,000.00
Received from sales	749.48
Total	400,749.48

ABSTRACT OF CONTRACT IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1911.

Name of contractor: Yuba Consolidated Gold Fields; contract entered into August 31, 1909; work to be completed by December 31, 1910. The contract provided that the contractor should strengthen approximately 5,200 linear feet of the north training wall below Daguerre Point Cut, Yuba River, Cal., for the sum of $45,000.

GENERAL PROJECT FOR CONTROL OF DÉBRIS AND FLOODS IN THE SACRAMENTO AND FEATHER RIVERS.

The closing paragraphs of a preliminary report or project submitted by the commission on June 30, 1907, and printed in the Annual Report of the Chief of Engineers for 1907, part 3, pages 2262–2269, were as follows:

> In pursuance of these conclusions and in compliance with the requirements of the act of March 1, 1893, the commission recommends as follows:
>
> That for the direct improvement of navigation in the Feather and Sacramento Rivers and toward the controlling of débris and floods an appropriation of $400,000 be made by Congress, its expenditure to be contingent on the appropriation of an equal

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[1] In addition to the appropriations made by Congress the State of California has appropriated a total of $400,000 to pay one-half the expense of the Yuba River project.

amount by the State of California; these sums to be devoted to the construction of two hydraulic dredges and to their operation and maintenance in accordance with the general terms of this report; provided, furthermore, that all rights of way for levees and spoil banks shall be furnished free of cost to the United States.

Following the above, the Legislature of the State of California on March 1, 1909, appropriated $400,000 for the proposed work, and Congress, by act of June 25, 1910, appropriated $400,000 therefor. The $400,000 appropriated by the Legislature of the State of California has not been deposited in the Treasury of the United States as required under the terms of the act of Congress, approved June 25, 1910. It is understood, however, that the State authorities have arranged to make this deposit immediately after June 30, 1911.[1]

The act of Congress of June 25, 1910, stipulated that the work should not be begun until all rights of way needed for levees and spoil banks have been furnished the United States free of cost.

The Sacramento and San Joaquin River Improvement Association, a corporation organized for the purpose of acquiring and turning over to the United States the necessary rights of way, has been engaged during the past year in acquiring title to the necessary lands. It appears that it will be necessary for the association to resort to condemnation proceedings in several cases.

In the meantime plans and specifications for the two hydraulic dredges referred to in the commission's preliminary report of June 30, 1907, have been prepared and it is proposed to invite proposals at an early date for constructing and delivering the dredges.

The sum of $855.13 was expended on this project during the past fiscal year, the same being for plans and specifications for two 20-inch suction dredges.

APPROPRIATIONS.

Act of Congress, June 25, 1910	$400,000
Act of legislature of State of California, Mar. 1, 1909	400,000
Total	400,000

Respectfully submitted.

John Biddle,
Colonel, Corps of Engineers.
S. A. Cheney,
Major, Corps of Engineers.
Chas. T. Leeds,
Captain, Corps of Engineers.

The Chief of Engineers, United States Army.

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[1] Deposited in Treasury of the United States July 1, 1911.

APPENDIX C C C.

AQUEDUCT BRIDGE, DISTRICT OF COLUMBIA.

REPORT OF LIEUT. COL. W. C. LANGFITT, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

UNITED STATES ENGINEER OFFICE,
Washington, D. C., June 30, 1911.

SIR: I have the honor to forward herewith annual report for the fiscal year ending June 30, 1911, for the Aqueduct Bridge, District of Columbia.

Very respectfully,
W. C. LANGFITT,
Lieut. Col., Corps of Engineers.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

REPAIR OF THE AQUEDUCT BRIDGE ACROSS THE POTOMAC RIVER AT WASHINGTON, D. C.

WORK OF THE FISCAL YEAR ENDED JUNE 30, 1911.

REPAIRS TO OLD PIERS.

As there had been no unusual or severe freshets since the last examination and repairs were made, in May, 1910, no examination by diver was undertaken during the fiscal year. An inspection of the portions of the piers above water, made late in June, showed that considerable pointing up is necessary, particularly in the joints of the granite ice breakers at and near the water line. It is proposed to make an examination by diver during the summer or fall of 1911, when this pointing up will be done and such repairs below water as may be found necessary and feasible will be made.

Attention is invited to the report of Capt. Warren T. Hannum, Corps of Engineers, for the fiscal year 1910, in which is explained the necessity for adopting a more radical method of repairing these old piers than is practicable with the funds available at present. Some one of the three methods suggested should be adopted at an early date. Considering economy, effect on river flow, present and prospective traffic, plan A, providing for new piers and superstructure, is recommended, the estimated cost of which is $950,000.

APPENDIX D D D.

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, AND WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, FILTRATION PLANT.

REPORT OF LIEUT. COL. W. C. LANGFITT, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDED JUNE 30, 1911.

UNITED STATES ENGINEER OFFICE,
Washington, D. C., July 20, 1911.

SIR: I have the honor to forward herewith annual reports for the fiscal year ended June 30, 1911, for Washington Aqueduct, District of Columbia, and Washington Aqueduct, District of Columbia, Filtration Plant, in my charge.

Very respectfully,
W. C. LANGFITT,
Lieut. Col., Corps of Engineers.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

D D D 1.

Operations were carried on during the fiscal year under the following appropriations:

1. Maintenance and operation of the Washington Aqueduct and its accessories, act of Congress approved May 18, 1910.
2. Lining unlined sections aqueduct tunnels.
3. For the preservation and repair of Cabin John Bridge, including the installation of a metal lining, act of Congress approved March 2, 1911.
4. Reconstruction Conduit Road.
5. Assistant overseer's house at Great Falls.
6. Construction of the Metropolitan Southern Railroad and Washington & Western Railroad through Dalecarlia Reservation of the Washington Aqueduct.
7. Increasing the water supply, Washington, D. C.
8. For purchase, installation, and maintenance of water meters, act of Congress approved May 18, 1910.
9. Maintenance and operation of the Washington Aqueduct, District of Columbia, Filtration Plant, general, act of Congress approved May 18, 1910.
10. For the construction of works for applying a coagulant to the water supply and for the purchasing of a coagulant, act of Congress approved May 18, 1910.
11. Remodeling of the Georgetown Reservoir.
12. For continuation of parking grounds of McMillan Park, act of Congress approved May 18, 1910.
13. McMillan Memorial Fountain.
14. Emergency fund.

WASHINGTON AQUEDUCT.

1. MAINTENANCE AND OPERATION.

The following operations were conducted during the fiscal year under the appropriation made for the maintenance and repair of the Washington Aqueduct and those parts of the water-supply system of the District of Columbia that are under the supervision of the Chie of Engineers:

GATEHOUSES, BUILDINGS, AND GROUNDS.

At Great Falls the buildings and grounds were kept in good condition.

At Dalecarlia Reservoir the two frame houses were painted, and filtered city water was supplied to the two houses south of the reservoir.

At Georgetown Reservoir modern fixtures were installed in the bathroom in the overseer's house and filtered city water supplied. A fence of heavy concrete posts and panels and low steel pickets was built along the west side of the Conduit Road extending 339 feet south and 161 feet north of the west shaft gatehouse. The board fences around the grounds are being replaced with a heavy wire fence supported on reenforced concrete posts, 1,075 linear feet having been built during the fiscal year.

At 2728 Pennsylvania Avenue a garage for the motor truck and a fireproof oil house were built and the old blacksmith shop was torn down and removed.

At McMillan Park Reservoir a hot-water heating plant was installed in the foreman's house, and both this house and the one occupied by the superintendent were painted and repaired.

THE CONDUIT.

The conduit between the intake and gatehouse at Great Falls was cleaned out once, at which time about 80 cubic yards of deposit was removed.

Mud deposited from the conduit upon opening waste weir No. 1 was removed from the Chesapeake & Ohio Canal in front of the waste weir. Several leaks in the conduit, near manholes Nos. 5 and 30 and at culvert No. 12, were repaired.

THE ROADS.

The total length of roads maintained under this office is 14 miles.

For convenience in describing the condition of various parts of these roads they are divided into ten sections as follows:

	Feet.	Miles.
Sec. 1.—Foxhall Road to Elliott Place	2,580	0.49
Sec. 2.—Elliott Place to culvert No. 26	3,487	.66
Sec. 3.—Culvert No. 26 to Little Falls Road	8,775	1.66
Sec. 4.—Little Falls Road to top of Dalecarlia Hill	3,279	.62
Sec. 5.—Top of Dalecarlia Hill to culvert No. 22	3,280	.62
Sec. 5a.—Culvert No. 22 to culvert No. 20	4,444	.84
Sec. 6.—Culvert No. 20 to Cabin John Bridge	7,635	1.44
Sec. 7.—Cabin John Bridge to bridge No. 3	6,564	1.24
Sec. 7a.—Bridge No. 3 to culvert No. 10	7,377	1.40
Sec. 8.—Culvert No. 10 to Anglers' Club	8,587	1.62
Sec. 9.—Anglers' Club to Great Falls	13,056	2.48
Sec. 10.—In McMillan Park	4,900	.93
Total	73,964	14.00

During the fiscal year the amount of work done on the roads and its cost is shown in the following table:

TABLE 1.—*Showing amount and cost of work on roads.*

Sections.	Linear feet.	Square yards.	Material used. (Tarvia.)		Broken stone used.	Cost per square yard.			
			Grade.	Quantity.		Tarvia.	Stone.	Labor.	Total.
				Gallons.	*Cu. yds.*				
Nos. 1 and 2	5,150	7,025	B	2,850	....	0.028	....	0.011	0.039
Do	513	912	A	839	12	.074	0.018	.030	.122
No. 4	2,378	4,228	A	2,990	146	.057	.054	.027	.138
No. 6	3,322	5,156	A	3,362	179	.043	.054	.084	.181
No. 7	825	1,125	B	540	....	.034	....	.026	.060
No. 10	900	2,300	A	4,252	409	.148	.300	.276	.724
Total	13,088	20,746	....	14,833	746	....	....	....	....

The areas of road treated with tarvia A on section 6 were plowed, shaped, and rolled. About 0.7 gallon of tarvia per square yard was then applied hot from a tank wagon; a thin layer of screenings was then spread over the tarvia and rolled.

The areas of road treated with tarvia B were swept reasonably free of dust and about 0.4 gallon of tarvia per square yard applied from sprinkling cans. Tarvia B was applied in the fall of 1910. In the spring of 1911 automobiles passing over portion of section 2 between Elliott Place and the Georgetown effluent gatehouse, where there are several sharp turns and the road has a grade of about 3 per cent, raveled the road badly. Tarvia A was then applied, about 0.9 gallon per square yard, and stone screenings placed on top while the tarvia was hot. The result is a smooth, practically dustless surface, with no raveling evident up to the latest inspection.

The part of section 10 which was resurfaced, being a gravel and clay road, was covered with about 3 inches of broken stone (loose) in sizes between three-fourths inch and 1½ inches. This layer of stone was rolled; about 1.4 gallons of tarvia X per square yard of surface was applied hot from tank wagons. Upon this it was intended to spread and roll a layer of stone screenings three-fourths inch and smaller in quantities slightly more than sufficient to fill the voids, and to cover this layer with about 0.7 gallon of tarvia A per square yard, followed by more screenings to take up excess tarvia, but on account of nonreceipt of materials ordered it will be necessary to do this work in fiscal year 1912. There were also 825 linear feet, or 550 square yards, of concrete sidewalk laid along the road in section 10. In repairing section 4 the method used was the same as described above for section 10, except that the tarvia A was not applied until the spring of 1911, by which time the road, especially on the 6 per cent grade and on curves, had raveled in certain small areas. Since final treatment this section has been in good condition. The value of this method of treatment will depend upon how the surfacing holds up during the next few years.

The tarvia was a refined coal tar, being a by-product from the works of the Washington Gas Light Co. The designation and trade name are as used by the Barrett Manufacturing Co.

A survey was made of the Washington Aqueduct property along the Conduit Road from Foxhall Road to the District line, and two sets of maps, one on a scale of 100 feet to the inch and the other on a scale of 40 feet to the inch, were made.

THE TUNNEL.

The Washington Aqueduct Tunnel was pumped out and inspected from Widow's Mite air shaft to the east shaft.

On the last occasion as a preliminary to draining the tunnel the filters were filled to their full capacity several days before the work of pumping was begun. The McMillan Park Reservoir was filled as full as possible. The blow-off at Rock Creek was opened at 1.25 a. m. November 29, the tunnel discharging by gravity until 5 a. m., when the centrifugal pumps at Rock Creek were started. The air lifts at Champlain Avenue and east shaft were started at 6 a. m. and 6.45 a. m., and on account of the failure to maintain pressure of steam at Rock Creek, where only one centrifugal pump could be kept continuously in operation, the air lifts worked with the centrifugal pumps until the water was reduced below the level of the summit east of Rock Creek about 11 a. m. The section of the tunnel drained by the air lifts at the east shaft was emptied at 9.20 a. m. on the 30th, and that section drained by the air lifts at the Champlain Avenue pumping station was emptied at 1.30 p. m.

An inspection party composed of the officer in temporary charge and the superintendents of the Aqueduct and the filtration plant made an inspection of the entire section of the tunnel east of the summit lying east of Rock Creek.

This being the first time that this section of the tunnel was drained since the tunnel was put into operation in 1902, this inspection was the first made since the latter date. The brick walls of the tunnel and also the rubble masonry walls were found to be in excellent condition. The invert of the tunnel as well as all the walls were found to be free from any sedimentary deposit. The only obstruction found in the tunnel was some plaster which had fallen from the rubble masonry side walls, which was insignificant in amount and harmless to the operation of the tunnel. Seepage into the tunnel was small in amount and usually through holes which had been used for grouting or in very thin streams through joints in the brick. The entrances to the inlet of the air lifts were found to be unobstructed.

The inspection having been completed, the filling of the tunnel began about 4.15 p. m. by opening two gates 6 inches at the west shaft, Georgetown Reservoir. The gates at the east shaft were kept closed until the tunnel was filled. The gates at the west shaft were opened an additional 6 inches at 5 o'clock and at each hour thereafter until the tunnel was filled. By this means the filling of the tunnel (capacity about 20,000,000 gallons) was accomplished in about four hours. The time occupied previously in filling the tunnel was eight hours. The waves and water hammer created by filling the tunnel caused the water to be forced up the air shafts at the different summits. At the Thirteenth Street shaft, the top of which is covered with a manhole cover in the west sidewalk above Florida Avenue, the water spouted through the holes in the manhole cover, rising several feet above the sidewalk.

The tunnel was out of use for 43½ hours.

THE BRIDGES.

The flooring on bridge No. 6 across Rock Creek was renewed and minor repairs were made to the bridges along the aqueduct.

THE MAINS.

Prior to August, 1905, the mains leading from the distributing reservoir were used for a gravity supply to the city. On August 21, 1905, the gates at the distributing reservoir were closed, and since that date the entire supply has passed through the tunnel to the McMillan Park Reservoir. The mains are now more than ever an integral part of the city distributing system.

By mutual agreement they are now operated and maintained by the city water department. It is again recommended that their formal transfer to the city be authorized.

TURBIDITIES.

The practice of closing the inlet gates at Great Falls whenever the turbidity of the Potomac water reaches 500 or more, as described in the Annual Report of the Chief Engineers for 1906, pages 2090 and 2091, was continued during the fiscal year, with the results shown in the following table, which are, of course, only approximate.

TABLE 1.—*Table showing tons of suspended matter entering system, etc.*

	Amount that would have entered the system if the gates had been left continuously open.	Hours gates were closed.	Amount shut out.	Amount deposited in Dalecarlia Reservoir.	Amount deposited in Georgetown Reservoir.	Amount deposited in McMillan Park Reservoir.	Amount entering filtration plant.	Total.
July	212	15.0	32	75	22	43	40	212
August	52	46.0	3	10	7	19	13	52
September	81	84.0	11	23	4	31	12	81
October	70	96.0	8	19	4	26	13	70
November	41	44.5	2	9	5	16	9	41
December	52	....	....	18	6	22	6	52
January	589	151.5	230	157	108	47	47	589
February	639	64.5	499	32	35	33	40	639
March	167	30.0	3	76	25	27	36	167
April	228	148.0	74	58	33	18	45	228
May	65	57.5	4	12	8	9	32	65
June	906	249.5	537	224	25	67	53	906
Total	3,102	986.5	1,403	713	282	358	346	3,102

From the above it is seen that the gates were closed 11.26 per cent of the time, thereby excluding 45.23 per cent of the total suspended matter that would otherwise have entered the system.

CONSUMPTION AND WASTE OF WATER.

Tables showing the average consumption of water per 24 hours, by years from 1874 to 1906 and by months from July, 1899, to January, 1903, will be found in the Annual Report of the Chief of Engineers for 1906, page 2092, and by months for the period January, 1903, to June, 1910, in the Annual Report of the Chief of Engineers for 1910, page 2632. The following table covers the fiscal years 1910 and 1911 and the accompanying diagram gives a comparison with the consumption for previous years since 18

TABLE 2.—*Table showing average consumption of water for 24 hours.*

[In million gallons.]

	Fi 191
July	64.
August	61.
September	60.
October	59.
November	55.
December	56.
January	62.
February	60.
March	56.
April	58.
May	57.
June	58.
Average	59.
Average per capita consumption	1

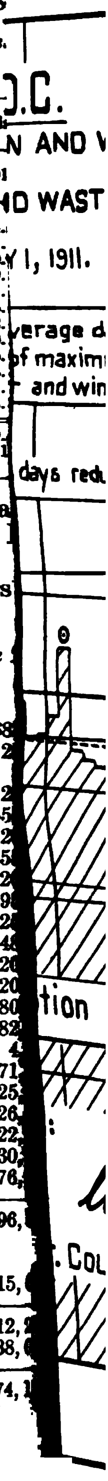
Per capita consumption for 1911 is based on a popul 348,460, which is that assumed by the health department, of Columbia.

The maximum daily amount of water pumped to the filters the year was 78,320,000 gallons.

Appropriations for the Washington Aqueduct, dates of acts, and reversions to the

APPROPRIATIONS 1850–1900, INCLUSIVE.

Sept. 30, 1850	$500.00	Feb. 25, 1885	$8
Aug. 31, 1852	5,000.00	Mar. 3, 1885	2
Mar. 3, 1853	100,000.00	Mar. 26, 1886	
Mar. 3, 1855	250,000.00	July 9, 1886	2
Aug. 18, 1856	250,000.00	Aug. 4, 1886	55
Mar. 3, 1857	1,000,000.00	Mar. 3, 1887	2
June 12, 1858	800,000.00	Mar. 30, 1888	35
June 25, 1860	500,000.00	July 18, 1888	2
July 4, 1864	150,000.00	Mar. 2, 1889	59
July 28, 1866	142,584.00	Aug. 6, 1890	2
Dec. 20, 1866	12,000.00	Sept. 30, 1890	48
Mar. 2, 1867	20,000.00	Mar. 3, 1891	20
July 20, 1868	10,000.00	July 14, 1892	20
July 25, 1868	52,500.00	Mar. 3, 1893	80
Mar. 3, 1869	25,000.00	Aug. 7, 1894	82
July 15, 1870	120,822.00	Aug. 18, 1894	4
Mar. 3, 1871	114,196.00	Mar. 2, 1895	71,
June 10, 1872	70,555.00	June 11, 1896	25,
Jan. 23, 1873	14,000.00	Mar. 3, 1897	26,
Mar. 3, 1873	43,600.00	June 30, 1898	322,
June 23, 1874	36,400.00	Mar. 3, 1899	230,
Mar. 3, 1875	26,000.00	June 6, 1900	176,
July 31, 1876	22,000.00		
Mar. 3, 1877	15,000.00	Total	8,296,
June 20, 1878	15,000.00	Received from sale of land, etc., prior to 1880; reverted to appropriation	15,
July 1, 1879	20,000.00		
June 4, 1880	20,000.00		
Mar. 3, 1881	20,000.00		8,312,
July 1, 1882	20,000.00		
July 15, 1882	1,485,279.30	Reverted to Treasury	38,
Mar. 3, 1883	20,000.00		
July 5, 1884	20,000.00	Net amount expended	8,274,
July 7, 1884	87,500.00		



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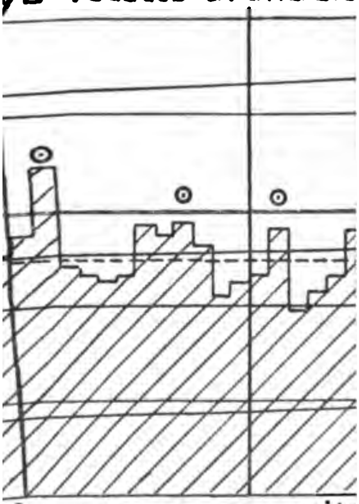

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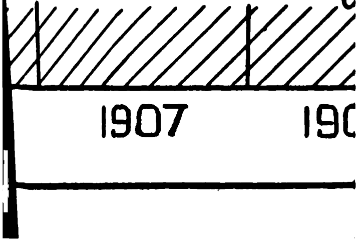

APPROPRIATIONS 1901-1910, INCLUSIVE.

Mar. 1, 1901		$184,222.97
July 1, 1902		102,490.00
Mar. 3, 1903		33,000.00
Apr. 27, 1904		33,000.00
Mar. 3, 1905		33,000.00
June 27, 1906		33,000.00
Mar. 2, 1907		102,000.00
May 26, 1908		43,000.00
May 26, 1908		[1] 6,000.00
Mar. 3, 1909		33,000.00
May 18, 1910		33,000.00
Total		635,712.97
Reverted to Treasury	$12,057.65	
Outstanding liabilities, June 30, 1911.	2,546.03	
		14,603.68

Net amount expended, 1901-1911	$621,109.29
Net amount expended, 1850-1900	8,274,181.04
Total net expended	8,895,290.33
(*a*) For construction	7,784,824.44
For operation, maintenance, and repairs	1,110,465.89
(*b*) Paid by the United States	6,352,797.45
Paid by the District of Columbia	2,542,492.88

2. LINING CERTAIN UNLINED PORTIONS OF THE AQUEDUCT.

There is in the aqueduct a total length of 4,364 feet of tunnel through rock, which is unlined. The best engineering practice of the present day would require all tunnel in rock to be lined for use as an aqueduct. In these unlined sections of the aqueduct there are certain places where the rock is disintegrating and falling from the roofs and sides of the tunnels. Such portions of the unlined sections of the tunnels should be lined for the sake of the stability of the aqueduct, and to remove the danger to the lives of employees engaged in cleaning or inspecting the aqueduct. To do this work it will be necessary to drain the aqueduct between Great Falls and Dalecarlia Reservoir, thus interrupting the supply of water from the river. During the time that the supply is thus interrupted the city will draw on the reserve supply, which is limited to such an extent that, for the present average daily consumption of water, it will be possible to keep the aqueduct drained for approximately only four consecutive days. It will then require about 14 days for the reservoirs to refill. It is therefore estimated that it will be practicable, under present conditions of consumption of water, to work on the lining of the tunnel only 64 days in a year, making allowance for 77 days between the middle of December and the end of February, when it will not be possible to interrupt the supply from the river on account of the probability of excessive demand for water in the city during periods of very cold weather. Under such conditions the work of lining the tunnels will not be continuous, and on this account, and on account of the locations of the sections to be lined and the restricted space in which it will be possible to work, the work will probably extend over more than one fiscal year and will be more expensive than work of the same character under favorable conditions. Under these conditions an accurate estimate can not be submitted until some lining is actually accomplished. The appropriation of $8,000 available for fiscal year 1912 will, on account of the preparation of the invert of tunnel which is above grade, the installation of sluice gate to properly drain the tunnel while working inside, and the purchase of plant, permit but a small portion of tunnel to be lined. An estimate of $12,000 is therefore submitted to cover the purchase of the plant that may be necessary and not now on hand, and to do as much work as may be possible during the fiscal year 1913.

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[1] Reappropriated from unexpended balance of appropriation of $90,000, act of Congress Mar. 2, 1907. Expended under Washington Aqueduct for parking grounds, McMillan Park Reservoir.

3. PRESERVATION AND REPAIR OF CABIN JOHN BRIDGE.

For many years considerable leakage has occurred in the section of the conduit which passes through Cabin John Bridge.

In 1863, when the water-supply system was first put in service, the water was not allowed to rise high enough to fill the conduit completely, but with the increased consumption of water, however, the elevation of its surface has been raised until in recent years even the crown of the conduit has been under pressure due to a head of about 2 feet.

When first used, leakage was observed and the water was drawn off and the lower part of the conduit was plastered. In a recent attempt to stop the leaks the upper portion of the conduit was plastered. While this doubtless reduced the leakage, there was still a very noticeable flow through the joints of the lining and the masonry in cold weather. This caused disintegration of some of the masonry and an unsightly appearance as well as a considerable waste of water. Several cracks developed in the lining of the conduit. These were kept filled with mortar, but continued to open until this feature became so serious that an appropriation was requested in a report published as Document No. 1329, House of Representatives, Sixty-first Congress, third session, for placing a metal lining in the conduit. An appropriation of $35,000 for the preservation and repair of the bridge was contained in the District of Columbia appropriation act approved March 2, 1911, $2,000 of which was made immediately available.

Considerable work has already been done in cutting out such portions of the brick lining as interfered with this new lining. A contract has been entered into with the Camden Iron Works to furnish the castings for the lining, a storehouse has been built, and two derricks have been erected to handle the castings when they are received.

4. CONDUIT ROAD RECONSTRUCTION.

From the distances shown in the table under item 1 it may be seen that there are 14 miles of road to be maintained by this office. The Conduit Road generally lies over the conduit and is practically level. There is one hill at the Dalecarlia Reservoir, which formerly had a grade of 12 per cent. This hill has recently been regraded to such an extent that the present grade is only 6 per cent. There are also several hills in the 2½ miles in section 9. On account of its easy grades between the Anglers' Club and Foxhall Road the Conduit Road serves exceptionally well the purpose of a highway for heavy traffic, and the whole length of road is an attractive one for automobile and pleasure rides.

The advantages of this road, which originally was for construction purposes, were early appreciated, and it soon became the main highway to Washington from the sections of Montgomery County in its vicinity. The annual report of the officer in charge of the aqueduct for the year 1868 reports that "the road over it (conduit) has become a great highway for the farmers living along the line of it; many roads also lead into it. As it has come into such general use it should be macadamized. The soil being of clay is easily cut through in wet weather to the crown of the arch." The necessity for macadamizing was recognized by the appropriation between 1870 and 1875 of $46,000, which provided funds sufficient to complete 9.4 miles of the roadway between Georgetown and culvert No. 6. The macadamizing of the roadway required the embankments at the different fills along the line to be widened. The cost per mile was about $5,000.

Between the fiscal years 1877 and 1883 the annual reports of the officer in charge contained estimates of $10,000 for continuing the macadamizing of the road, but no appropriation was made. In 1893 and 1894 the officer in charge submitted an estimate of $34,500 for widening the Conduit Road to 30 feet between Georgetown and the District line, in order to provide for a roadway which should conform to the general conditions of the streets in the city, but no funds were appropriated for this purpose. In the annual reports about the year 1897, and subsequently, attention was called to the fact that $5,000 annually would be required for the maintenance of the Conduit Road, but, with the exception of a special appropriation of $1,000 made in 1898, and the increase of the appropriation by $1,000 in 1899 and by $2,000 in 1900, no additional funds were provided for continuing the macadamizing of the road and the maintenance of the portion already macadamized. So, with the exception of the small amounts noted, since 1876 the short extensions of the macadamized portions of the road and the maintenance of the road have been carried on by the use of funds appropriated for the general maintenance of the aqueduct system. These funds have been small compared to the total cost of construction of the aqueduct system. The present annual appropriation for maintenance and operation is an annual charge of only 0.42 per cent of the total investment of $8,860,000, a part of the present system, valued at five-eighths of the total cost, having been in service nearly 50 years and a part, valued at three-eighths of the total cost, nearly 10 years. Every endeavor has been made by the officer in charge to gradually place and maintain the Conduit Road in good condition, but it has necessarily proved unsuccessful on account of the many other items of repairs to other parts of the system demanding attention and each year becoming more numerous and urgent.

It is self-evident that if in 1868 the comparatively limited traffic demanded a macadamized road the traffic now still more imperatively calls for proper roadway surfacing. The increasing use of the road by automobiles has been followed by the result noted in other places, that it is useless to attempt to maintain at reasonable cost the water-bound macadam road. Entire resurfacing of the road is practically necessary.

The necessity for special maintenance funds for the road or an increase in the regular maintenance fund for the aqueduct and its appurtenances has been called to the attention of Congress in many annual reports. The condition is now so serious that it is believed another special effort should be made to obtain special recognition of the necessity in the annual appropriations. The road is an essential part of the aqueduct system. All supplies for repairs and construction are hauled over it. As an instance, during the coming summer about 300 tons of heavy iron castings must be hauled from Dalecarlia to Cabin John Bridge. Proper drainage and wearing surface suited to the traffic must be provided.

Between the Anglers' Club and Great Falls the roadway is generally of earth which is graded occasionally to preserve as well as may be the crown and to provide drainage of the water along the sides of the road. In winter and other seasons of the year when the road is wet the surface becomes very muddy and at times almost impassable. Between the Angler's Club and culvert 19, just below Cabin John Bridge, the roadway is generally in fair condition, having a fair crown, and will probably be preserved for several years by the application of Tarvia A and screenings. Between culvert 19 and Dalecarlia Reservoir the roadway is in very poor condition, the crown in most cases being completely worn away, numerous ruts having formed, permitting the water after a rainfall to stand on the roadway. Between Little Falls Road and the Georgetown Reservoir the conditions are about the same as above Dalecarlia Reservoir. At and below the Georgetown Reservoir the condition of the road is about the same as the section above Cabin John Bridge.

Estimates, based on present condition of the road in its different sections and on the minimum economical treatment, have been prepared, from which it appears that between $40,000 and $45,000 will be needed. These estimates include nothing for widening or adornment, though in time the increasing use will require both to make the road a proper and satisfactory part of the Government work, especially, as it is seen and used by so many of the public, and its natural attractiveness could be greatly enhanced.

The routine operations and maintenance of the aqueduct requires $22,000, not including any of the usual repairs and improvements, thus leaving but $11,000 for the upkeep of the system costing over $8,000,000. It is evident that but very little of the $11,000 can be devoted to the road, and that unless special provision is made therefor its condition will become so poor that it may be necessary to restrict the use of the road by the general public so that it may be maintained in a passable condition for use in operation and maintenance of the aqueduct system.

5. QUARTERS FOR ASSISTANT TO OVERSEER AT GREAT FALLS, MD.

It has always been difficult to secure the services of a reliable and intelligent person to assist the overseer at Great Falls in the performance of his duties, owing to the lack of suitable and convenient habitation for such a person, no suitable building in the neighborhood being available for renting.

There is submitted an estimate of $2,500, or so much thereof as may be necessary, to provide the labor and purchase materials of construction not now available in order to provide quarters for the assistant to the overseer at Great Falls.

6. CONSTRUCTION OF THE METROPOLITAN SOUTHERN RAILROAD AND WASHINGTON & WESTERN MARYLAND RAILROAD THROUGH THE DALECARLIA RESERVATION OF THE WASHINGTON AQUEDUCT.

For the history of this work attention is invited to Annual Report of Chief of Engineers, 1909, page 2316, and Annual Report of Chief of Engineers, 1893, page 4288. Work on this construction was completed during the year by the railroad company (Baltimore & Ohio R. R.). The necessary inspection charges were paid from the deposit of $1,500 made by the company in accordance with the regulations, approved by the Secretary of War, governing the construction of the railway, and the balance returned to the company. At the same time the construction of the Washington & Western Maryland Railroad (subsidiary of the Baltimore & Ohio R. R.) was completed through the reservation and the $300 deposited to cover inspection charges returned to the company.

7. INCREASING THE WATER SUPPLY OF WASHINGTON, D. C.

By act of Congress, approved May 26, 1908, $10,000 was appropriated for preliminary investigations and surveys for increasing the water supply.

The results of these investigations, with recommendations, were made the subject of a special report to the Chief of Engineers by the officer in charge, which report was submitted on July 8, 1909.

On pages 4, 5, 7, 8, 84, and 85 of said report reference is made to increasing the water supply by using the Patuxent River as a source, on which a special report will be submitted during the fiscal year 1912 under the appropriation made by Congress in act approved March 2, 1911.

8. METERING WATER SUPPLY OF UNITED STATES BUILDINGS AND GROUNDS.

Meters were installed on the mains which furnished the water supply for the Government Printing Office, the United States Navy Yard, and the Municipal Building, District of Columbia.

The Printing Office was formerly supplied through one 12-inch, two 6-inch, and one 4-inch main. In order to be able to measure all the water with one meter, it was necessary to so modify the piping that the entire building could be supplied from one main. This work was done and a 16-inch Venturi meter with an 8-inch throat and a type M register indicator recorder was installed on the 12-inch main supplying the building, but on account of certain changes being made by the Superintendent of the Government Printing Office all the supply to the building was not passing through the meter at the end of the fiscal year.

The water supply for the navy yard is furnished through one 20-inch and one 12-inch main.

A 20-inch Venturi meter with a 9-inch throat and a type M register indicator recorder was installed in the 20-inch main. A 12-inch model F. M. Hersey detector meter was purchased for the 12-inch main, but owing to unexpected delays in the delivery of this meter the work of installing it was not quite completed, but will be carried out under agreement during the early part of July.

The Municipal Building is supplied with water through a 6-inch main, but the amount of water used is so small that it was found to be unnecessary to purchase a meter of that size. A 3-inch model F. M. Hersey detector meter was installed in the 6-inch main and a 6-inch by-pass was provided. This by-pass will be kept closed unless a sudden and urgent need of more water arises or the meter is out of order.

The necessity for the prompt installation of meters is explained in the report on "Increasing the water supply of the District of Columbia" (H. Doc. No. 347, 61st Cong., 2d sess.). The finding in this report that a new aqueduct was not necessary was based on the assumption, among others, that metering of all services in the District of Columbia would be immediately provided for. In the appropriation for the expenses of the District of Columbia for the fiscal year 1911 an appropriation was made to meter the supply to certain public buildings. An estimate of $38,000 is submitted to complete the installation of meters on all Federal services. It is understood that the District engineer department proposes to carry on vigorously the work of installation of meters on private services. It would appear that the General Government should lead in this matter. So far but three public buildings have been metered. The sum asked for will probably complete the work.

D D D 2.

WASHINGTON AQUEDUCT, DISTRICT OF COLUMBIA, FILTRATION PLANT.

9. MAINTENANCE AND OPERATION.

A general description of the filtration plant was given in Appendix D D D 2, pages 2101 to 2103, of the Annual Report of the Chief of Engineers for 1906.

Turbidities.—The maximum, minimum, and average turbidities of the samples of water tested during the year are shown in the following table:

TABLE 1.—*Turbidities.*

[United States Geological Survey standard.]

(A) MAXIMUM.

	Great Falls.	Dalecarlia Reservoir outlet.	Georgetown Reservoir outlet.	McMillan Park Reservoir outlet.	Filtered water reservoir.
1910.					
July	140	50	65	40	1
August	13	11	9	6	0
September	75	30	20	7	0
October	40	14	12	6	0
November	7	8	9	5	0
December	18	7	7	3	0
1911.					
January	350	120	70	40	1
February	1,000	70	60	28	1
March	85	45	26	20	1
April	180	50	24	28	0+
May	16	17	24	15	0+
June	1,500	100	65	35	0

TABLE 1.—*Turbidities*—Continued.

(A) MAXIMUM—Continued.

	Great Falls.	Dalecarlia Reservoir outlet.	Georgetown Reservoir outlet.	McMillan Park Reservoir outlet.	Filtered water reservoir.
Fiscal years—					
1906–7	1,530	250	150	250	13
1907–8	3,000	340	250	160	20
1908–9	1,500	200	170	85	8
1909–10	2,100	200	215	120	9
1910–11	1,500	120	70	40	1
(B) MINIMUM.					
1910.					
July	9	9	8	4	0
August	7	7	7	3	0
September	7	7	8	3	0
October	7	7	8	3	0
November	7	7	7	3	0
December	7	7	7	1	0
1911.					
January	13	10	7	2	0
February	15	14	16	12	0+
March	11	10	12	10	0+
April	14	15	14	12	0+
May	7	7	8	5	0
June	8	9	14	8	0
Fiscal years—					
1906–7	9	7	8	6	0+
1907–8	7	7	8	6	0
1908–9	7	7	6	5	0
1909–10	7	7	7	2	0
1910–11	7	7	7	1	0
(C) AVERAGES.					
1910.					
July	32	21	20	12	0+
August	8	8	8	4	0
September	13	10	11	4	0
October	11	9	10	4	0
November	7	7	7	3	0
December	8	7	7	2	0
1911.					
January	94	43	24	15	0+
February	111	27	22	15	0+
March	30	21	18	13	0+
April	41	23	18	16	0+
May	10	10	13	10	0
June	134	31	31	17	0
Fiscal years—					
1906–7	114	46	37	29	2
1907–8	117	53	45	31	2
1908–9	79	50	32	22	1
1909–10	86	30	29	18	1
1910–11	41	18	16	10	0

Bacteria.—Daily analyses have been made of samples of water taken at Dalecarlia Reservoir inlet (which are believed to represent fairly the river water at Great Falls), at the outlet of this reservoir, at Georgetown Reservoir inlet and outlet, at McMillan Park Reservoir inlet and outlet, in the filtered-water reservoir, and from each of the filters in operation. Samples from taps in various parts of the city are taken and tested once each week. All samples are tested by standard methods and the number of bacteria per cubic centimeter in each determined. In addition to this work many tests are made for the colon bacillus.

The results of this work are summarized in the following table:

TABLE 2.—*Bacteria per cubic centimeter.*

	Dalecarlia Reservoir.		Georgetown Reservoir outlet.	McMillan Park Reservoir outlet.	Filtered-water reservoir.
	Inlet.	Outlet.			
(A) MAXIMUM.					
1910.					
July	1,200	2,300	650	700	75
August	350	400	375	950	47
September	17,000	3,000	400	275	42
October	2,400	950	1,100	450	32
November	3,000	1,900	1,200	800	60
December	8,500	5,300	4,000	2,100	110
1911.					
January	65,000	49,000	25,000	25,000	300
February	28,000	20,500	21,000	12,500	140
March	11,000	9,500	3,900	3,800	60
April	10,000	2,200	1,800	1,100	35
May	1,100	700	500	575	21
June	75,000	2,300	2,500	475	17
Fiscal year—					
1906-7	63,000	24,000	23,000	15,000	200
1907-8	80,000	65,000	52,000	19,000	900
1908-9	90,000	12,500	13,000	3,500	160
1909-10	170,000	175,000	180,000	180,000	2,800
1910-11	75,000	49,000	25,000	25,000	300
(B) MINIMUM.					
1910.					
July	140	110	75	37	13
August	75	85	65	45	17
September	75	60	65	60	15
October	150	120	140	55	10
November	300	190	200	31	7
December	375	175	100	175	15
1911.					
January	8,800	6,500	2,400	450	22
February	1,000	1,200	850	1,000	36
March	1,400	1,350	1,100	700	9
April	450	325	150	85	6
May	25	34	33	19	5
June	140	80	75	23	3
Fiscal year—					
1906-7	70	50	30	36	4
1907-8	16	17	28	16	4
1908-9	38	65	25	9	2
1909-10	37	80	43	22	3
1910-11	25	34	33	19	3
(C) AVERAGES.					
1910.					
July	520	346	208	187	41
August	212	160	163	195	29
September	1,200	400	175	120	26
October	585	372	336	189	18
November	1,150	815	500	256	25
December	1,950	1,640	1,360	900	39
1911.					
January	25,800	22,850	11,400	7,300	135
February	12,250	9,490	8,030	4,960	83
March	5,650	4,350	2,310	1,620	28
April	2,300	955	745	348	13
May	230	180	153	109	8
June	6,180	498	565	128	9
Fiscal year—					
1906-7	4,850	1,940	1,680	635	31
1907-8	6,300	2,700	2,940	1,250	55
1908-9	3,130	1,950	960	390	21
1909-10	14,300	13,850	10,850	6,820	143
1910-11	4,820	3,370	2,080	1,390	38

TABLE 3.—*Results of tests for bacillus coli.*

(A) TOTAL SAMPLES EXAMINED.

	Great Falls or Dalecarlia Reservoir inlet.			Dalecarlia Reservoir outlet.			Georgetown Reservoir outlet.			McMillan Park Reservoir outlet (applied water).			Filtered water reservoir.		Tap water from various parts of the city.	
Cubic centimeters	10	1	0.1	10	1	0.1	10	1	0.1	10	1	0.1	10	1	10	1
1910.																
July	25	25	25	25	25	25	25	25	25	31	31	31	31	31	61	61
August	25	25	25	27	27	27	27	27	27	31	31	31	31	31	72	72
September	22	22	22	25	25	25	24	24	24	30	30	30	30	30	61	61
October	22	22	22	26	26	26	26	26	26	31	31	31	31	31	63	63
November	25	25	25	25	25	25	25	25	25	30	30	30	30	30	70	70
December	26	26	26	26	26	26	26	26	26	31	31	31	31	31	62	62
1911.																
January	24	24	24	25	25	25	25	25	25	31	31	31	31	31	61	61
February	23	23	23	23	23	23	23	23	23	28	28	28	28	28	50	50
March	27	27	27	27	27	27	27	27	27	31	31	31	31	31	72	72
April	21	21	21	25	25	25	25	25	25	29	29	29	30	30	61	61
May	26	26	26	25	25	25	26	26	26	31	31	31	31	31	71	71
June	26	26	26	26	26	26	26	26	26	30	30	30	30	30	62	62
Fiscal years—																
1905-6	108	108	108	155	155	155	121	121	121	169	169	169	171	171	80	80
1906-7	156	156	156	130	130	130	131	131	131	292	292	292	292	292	523	523
1907-8	307	307	307	65	65	65	122	122	122	351	351	351	351	351	765	765
1908-9	296	296	296	40	40	40	106	106	106	365	365	365	365	365	782	782
1909-10	286	286	286	170	171	171	177	177	177	365	365	365	365	365	774	774
1910-11	292	292	292	305	305	305	305	305	305	364	364	364	365	365	766	766

(B) NUMBER POSITIVE.

	Great Falls or Dalecarlia Reservoir inlet.			Dalecarlia Reservoir outlet.			Georgetown Reservoir outlet.			McMillan Park Reservoir outlet (applied water).			Filtered water reservoir.		Tap water from various parts of the city.	
Cubic centimeters	10	1	0.1	10	1	0.1	10	1	0.1	10	1	0.1	10	1	10	1
1910.																
July	16	9	2	13	5	1	8	2	0	14	4	0	2	0	0	0
August	3	1	0	5	0	0	4	0	0	4	0	0	0	0	1	0
September	13	7	2	8	5	2	7	0	0	5	0	0	0	0	0	0
October	9	4	1	11	3	1	8	0	0	4	1	0	0	0	0	0
November	8	0	0	6	1	0	4	0	0	5	2	0	0	0	0	0
December	8	1	0	3	0	0	4	1	1	0	0	0	0	0	0	0
1911.																
January	13	10	4	15	8	1	12	7	0	6	0	0	1	0	3	1
February	12	5	0	10	6	0	6	1	1	4	0	0	0	0	0	0
March	7	2	2	3	1	0	0	0	0	0	0	0	0	0	0	0
April	6	2	0	6	2	0	3	0	0	1	0	0	0	0	1	0
May	4	1	1	2	0	0	0	0	0	3	0	0	0	0	2	2
June	11	7	3	10	4	0	4	0	0	7	1	0	0	0	5	2
Fiscal years—																
1905-6	38	21	10	62	36	8	32	18	2	41	14	3	4	3	1	0
1906-7	96	68	30	75	38	16	67	39	14	95	38	4	13	6	28	5
1907-8	137	96	40	21	8	2	42	27	5	78	33	5	10	1	24	7
1908-9	115	60	25	12	6	0	29	9	3	61	26	3	3	0	9	3
1909-10	130	77	29	77	41	15	67	35	11	86	38	4	12	3	17	3
1910-11	110	49	15	92	35	5	60	11	2	53	8	0	3	0	12	5

(C) PERCENTAGE POSITIVE.

	Great Falls or Dalecarlia Reservoir inlet.			Dalecarlia Reservoir outlet.			Georgetown Reservoir outlet.			McMillan Park Reservoir outlet (applied water).			Filtered water reservoir.		Tap water from various parts of the city.	
Cubic centimeters	10	1	0.1	10	1	0.1	10	1	0.1	10	1	0.1	10	1	10	1
1910.																
July	64.0	36.0	8.0	52.0	20.0	4.0	32.0	8.0	0.0	45.2	12.9	0.0	6.5	0.0	0.0	0.0
August	12.0	4.0	.0	18.5	.0	.0	14.8	.0	.0	12.9	.0	.0	.0	.0	1.4	.0
September	59.1	31.8	9.1	32.0	20.0	8.0	29.2	.0	.0	16.7	.0	.0	.0	.0	.0	.0
October	40.9	18.2	4.5	42.3	11.5	3.9	30.8	.0	.0	12.9	3.2	.0	.0	.0	.0	.0
November	32.0	.0	.0	24.0	4.0	.0	16.0	.0	.0	16.7	6.7	.0	.0	.0	.0	.0
December	30.8	3.9	.0	11.5	.0	.0	15.4	3.9	3.9	.0	.0	.0	.0	.0	.0	.0
1911.																
January	54.2	41.7	16.7	60.0	32.0	4.0	48.0	28.0	.0	19.4	.0	.0	3.2	.0	4.9	1.6
February	52.2	21.7	.0	43.5	26.1	.0	26.1	4.4	4.4	14.3	.0	.0	.0	.0	.0	.0
March	25.9	7.4	7.4	11.1	3.7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
April	28.5	9.5	.0	24.0	8.0	.0	12.0	.0	.0	3.4	.0	.0	.0	.0	1.6	.0
May	15.4	3.8	3.8	8.0	.0	.0	.0	.0	.0	9.7	.0	.0	.0	.0	2.8	2.8
June	42.3	26.9	11.5	38.5	15.4	.0	15.4	.0	.0	23.3	3.3	.0	.0	.0	8.0	3.2
Fiscal years—																
1905-6	35.2	19.4	9.3	40.0	23.2	5.2	26.4	14.9	1.7	24.3	8.3	1.8	2.3	1.8	1.3	.0
1906-7	61.5	43.6	19.2	57.7	29.2	12.3	51.1	29.8	10.7	32.5	13.0	1.4	4.5	2.1	5.4	1.0
1907-8	44.6	31.3	13.0	32.3	12.3	13.1	34.4	22.1	4.1	22.2	9.4	1.4	2.8	.3	3.1	.9
1908-9	38.9	20.3	8.4	30.0	15.0	.0	27.4	8.5	2.8	16.7	7.1	.8	.8	.0	1.2	.4
1909-10	45.5	26.9	10.1	45.3	24.0	8.8	37.9	19.8	6.2	23.6	10.4	1.1	3.3	.8	2.2	.4
1910-11	37.6	16.8	5.1	30.2	11.5	1.6	19.7	3.6	.7	14.6	2.2	.0	.8	.0	1.6	.7

TABLE 4.—*Summary of sanitary chemical analyses of weekly samples.*

[Results in parts per million.]

	Turbidity.[1]	Ammonia.			Nitrogen as—		Hardness.	Alkalinity.	Chlorine.
		Free.	Albuminoid.	Total.	Nitrites.	Nitrates.			
(A) MAXIMUM.									
Dalecarlia Reservoir inlet	450	0.030	0.284	0.294	0.0150	0.80	119.5	115.2	5.5
Dalecarlia Reservoir outlet	120	.030	.278	.306	.0150	1.10	118.0	117.8	6.5
Georgetown Reservoir outlet	70	.030	.258	.268	.0100	1.20	116.5	115.7	7.5
McMillan Park Reservoir outlet	40	.024	.108	.114	.0080	1.10	122.5	116.0	5.7
Filtered water	1	.012	.072	.080	.0001	1.20	118.0	117.7	5.7
(B) MINIMUM.									
Dalecarlia Reservoir inlet	7	0.000	0.028	0.030	0.0003	0.00	37.7	28.3	1.3
Dalecarlia Reservoir outlet	7	.000	.014	.020	.0004	.00	37.7	28.0	1.4
Georgetown Reservoir outlet	7	.000	.020	.020	.0004	.01	37.7	35.0	1.2
McMillan Park Reservoir outlet	1	.000	.022	.024	.0005	.03	42.9	33.8	.6
Filtered water	0	.000	.010	.010	.0000	.00	42.9	34.7	.6
(C) AVERAGES.									
Dalecarlia Reservoir inlet	25	0.008	0.107	0.115	0.0026	0.27	84.5	73.2	3.3
Dalecarlia Reservoir outlet	18	.008	.117	.125	.0027	.32	82.9	73.0	3.4
Georgetown Reservoir outlet	16	.005	.122	.127	.0027	.29	82.3	73.1	3.2
McMillan Park Reservoir outlet	10	.004	.074	.078	.0024	.32	82.1	73.0	3.0
Filtered water	0	.001	.039	.040	.0000	.34	82.6	73.4	3.1

[1] Summary of daily samples of water.

TABLE 5.—*Summary of expenditures and liabilities incurred.*

	Labor.	Materials.	Total.
Office and laboratory	$17,266.17	$1,846.67	$19,112.84
Pumping station	14,260.93	15,073.41	29,334.34
Filter operations:			
(a) Sand handling	4,604.76	1,177.18	5,781.94
(b) Incidentals and repairs	1,592.33	1,811.93	3,404.26
Care of buildings and grounds	5,022.62	3,810.48	8,833.10
Construction (new work)	6,396.91	7,852.11	14,249.02
Main office	1,172.72	111.78	1,284.50
Total	50,316.44	31,683.56	82,000.00

TABLE 6.—*Amount of work done.*

	Million gallons water pumped to—		Number of filters—		Cubic yards of sand—	
	Filters.	Sand washers.	Scraped.	Raked.	Removed and washed.	Replaced in filters.
1910.						
July	1,990.82	10.028	12.4	6	2,033	1,725
August	1,947.30	12.619	13.6	2	2,229	2,604
September	1,877.75	2.964	2.0	12	441	248
October	1,892.48	4.443	2.0	8	350	1,504
November	1,737.32	3.048	5.0	6	674	....
December	1,945.92	5.685	8.7	....	1,151	....
1911.						
January	1,880.74	5.328	8.8	2	1,200	0
February	1,601.11	6.221	5.5	6	884	1,710
March	1,673.85	.099	....	....	....	....
April	1,672.91	8.216	5.9	13	1,369	1,593
May	1,954.20	11.030	13.1	5	2,181	2,122
June	1,865.55	10.249	14.0	11	2,429	1,712
Fiscal years—						
1905–6 [1]	19,402.82	42.40	68.07	....	[2] 16,137	5,172
1906–7	24,417.73	138.70	97.76	9	[3] 25,689	34,781
1907–8	23,758.24	76.98	126.67	86	22,275	21,393
1908–9	22,435.16	119.16	137.80	36	24,683	23,487
1909–10	21,605.44	91.777	87.2	51	15,505	16,876
1910–11	22,039.96	79.920	91.0	71	14,941	13,218

[1] First filter put in service Aug. 18; total water supply filtered after Oct. 6.

[2] 8,324 cubic yards washed.

33,502 cubic yards washed.

TABLE 7.—*Cost per million gallons filtered.*

(A) LABOR.

Fiscal years—	Office and laboratory.	Pumping station.	Filter operations.		Care of buildings and grounds.	Construction (new work).	Main office.	Experimental filters.	Total.
			Sand handling.	Incidentals and repairs.					
1905–6	$0.45	$0.45	$0.47	$0.02	$0.01	....	$0.09	....	$1.49
1906–7	.57	.57	.58	.21	.07	....	.04	$0.03	2.07
1907–8	.70	.59	.42	.32	.15	....	.09	.09	2.36
1908–9	.72	.61	.41	.34	.22	....	.13	.01	2.44
1909–10	.84	.70	.27	.23	.36	$0.02	.14	....	2.56
1910–11	.78	.65	.21	.07	.23	.29	.05	....	2.28

(B) MATERIALS.

1905–6	$0.04	$0.59	$0.02	....	....	....	....	....	$0.65
1906–7	.03	.67	.08	$0.20	$0.02	....	....	....	1.00
1907–8	.05	.54	.04	.07	.06	....	$0.01	....	.77
1908–9	.10	.69	.05	.18	.18	....	.02	....	1.22
1909–10	.13	.69	.02	.05	.17	$0.16	.02	....	1.24
1910–11	.08	.69	.05	.08	.17	.36	.01	....	1.44

(C) TOTALS.

1905–6	$0.49	$1.04	$0.49	$0.02	$0.01	....	$0.09	....	$2.14
1906–7	.60	1.24	.66	.41	.09	....	.04	$0.03	3.07
1907–8	.75	1.13	.46	.39	.21	....	.10	.09	3.13
1908–9	.82	1.30	.46	.52	.40	....	.15	.01	3.66
1909–10	.97	1.39	.29	.28	.53	$0.18	.16	....	3.80
1910–11	.86	1.34	.26	.15	.40	.65	.06	....	3.72

TABLE 8.—*Average cost of labor for sand handling.*

(A) PER MILLION GALLONS PUMPED TO FILTERS.

Fiscal years—	Scraping.	Ejecting.	Washing.	Smoothing.	Raking.	Resanding.	Total.
1905-6	$0.06	$0.29	$0.02	$0.06		$0.04	$0.47
1906-7	.07	.20	.05	.02		.24	.58
1907-8	.09	.14	.03	.01	$0.02	.13	.42
1908-9	.07	.15	.03	.01	.01	.14	.41
1909-10	.05	.10	.01	.01	.01	.08	.27
1910-11	.06	.08	.01	.01	.02	.03	.21

(B) PER CUBIC YARD OF SAND.

Fiscal years—	Scraping.	Ejecting.	Washing.	Smoothing.	Raking.	Resanding.	Total.
1905-6	$0.07	$0.35	$0.04	$0.07		$0.14	$0.67
1906-7	.06	.19	.03	.02		.17	.47
1907-8	.09	.15	.03	.01		.14	.42
1908-9	.06	.14	.03	.01		.13	.37
1909-10	.07	.14	.02	.02		.10	.35
1910-11	.09	.12	.01	.01		.05	.28

TABLE 9.—*Filter runs, or periods of operation.*

(A) FOLLOWING BOTH RAKINGS AND SCRAPINGS.

	Number of runs ending.	Duration in days.			Million gallons filtered.		
		Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
1910.							
July	20	87	19	53	194.28	47.26	115.87
August	14	86	20	38	192.39	48.44	87.51
September	14	88	47	59	218.96	122.84	146.75
October	10	81	59	71	211.56	115.64	166.38
November	12	99	55	75	199.15	107.31	161.93
December	8	85	61	74	190.38	125.03	145.31
1911.							
January	12	106	69	81	251.02	153.17	189.90
February	10	85	22	67	224.71	47.85	163.12
March	0	0	0	0	.00	.00	.00
April	21	139	59	90	304.83	113.38	187.92
May	16	89	17	49	192.05	41.55	104.35
June	26	60	26	45	141.22	58.93	104.90
Fiscal years—							
1905-6	72	195	38	91	497.45	116.66	241.30
1906-7	105	199	30	75	466.12	101.53	217.78
1907-8	219	138	9	46	477.19	20.11	121.46
1908-9	179	135	11	46	298.08	39.26	115.17
1909-10	142	129	21	70	307.57	45.22	154.96
1910-11	163	139	17	62	304.83	41.55	138.78

(B) FOLLOWING RAKINGS.

	Number of runs ending.	Duration in days.			Million gallons filtered.		
		Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
1910.							
July	11	77	19	37	144.25	47.26	82.21
August	11	43	20	33	102.21	48.44	76.49
September	0	0	0	0	.00	.00	.00
October	2	79	59	69	154.52	115.64	135.08
November	6	85	56	68	182.57	107.31	140.28
December	8	85	61	74	190.38	125.03	145.31
1911.							
January	9	86	69	76	209.38	153.17	177.49
February	3	73	23	55	169.69	47.85	127.40
March	0	0	0	0	.00	.00	.00
April	5	139	59	82	304.83	113.38	170.77
May	11	88	17	37	192.05	41.55	80.88
June	10	50	32	41	109.59	65.36	90.61
Fiscal year 1910-11	76	139	17	53	304.83	41.55	114.52

(C) FOLLOWING SCRAPINGS.

	Number of runs ending.	Duration in days.			Millions gallons filtered.		
		Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
1910.							
July	9	87	45	72	194.28	113.02	157.00
August	3	86	40	56	192.39	80.51	127.91
September	14	88	47	59	218.96	122.84	146.75
October	8	81	67	72	211.56	153.15	174.20
November	6	99	55	83	199.15	133.28	174.59
December	0	0	0	0	.00	.00	.00
1911.							
January	3	106	89	97	251.02	210.84	227.48
February	7	85	22	73	224.71	48.60	178.43
March	0	0	0	0	.00	.00	.00
April	16	130	60	93	280.81	127.78	193.29
May	5	89	64	74	189.37	130.15	155.99
June	16	60	26	47	141.22	58.93	113.82
Fiscal year 1910–11	87	130	22	70	280.81	48.60	159.97

TABLE 10.

(A) FILTERS SCRAPED.

	Number of filters scraped.	Cubic yards of sand removed.			Depth of scraping in inches.		
		Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
1910.							
July	12.4	354	134	164	2.63	1.00	1.22
August	13.6	273	117	164	2.03	.87	1.22
September	2.0	320	121	221	2.38	.90	1.64
October	2.0	184	166	175	1.37	1.23	1.30
November	5.0	141	124	135	1.05	.92	1.00
December	8.7	152	124	132	1.13	.92	.98
1911.							
January	8.8	149	125	136	1.11	.93	1.01
February	5.5	232	108	161	1.72	.80	1.20
March	.0	0	0	0	.00	.00	.00
April	5.9	438	127	232	3.26	.94	1.72
May	13.1	187	147	166	1.39	1.09	1.23
June	14.0	372	47	174	2.77	.35	1.29
Fiscal years—							
1905–6	68.07	600	71	238	4.47	.53	1.77
1906–7	97.76	536	52	201	4.00	.39	1.95
1907–8	126.67	498	46	180	4.10	.34	1.34
1908–9	137.8	580	55	206	4.32	.41	1.58
1909–10	87.2	524	81	179	3.90	.60	1.33
1910–11	91.0	438	47	164	3.26	.35	1.22

(B) FILTERS RESANDED.

Fiscal years—	Number of filters resanded.	Cubic yards of sand replaced.			Depth of sand replaced in inches.		
		Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
1905–6	4	2,313	1,615	2,048	17.2	12.0	15.2
1906–7	18	2,667	1,067	1,790	19.9	7.9	13.3
1907–8	11	2,430	1,354	2,007	18.1	10.1	14.9
1908–9 [1]	12	2,855	1,237	2,010	21.2	9.2	14.9
1909–10	7	2,961	1,354	2,118	22.0	10.1	15.7
1910–11	7	2,191	1,593	1,888	16.3	11.8	14.0

[1] Four filters filled by hydraulic injector. During the following years all filters filled by injector.

TABLE 11.—*Pumping station (daily results).*

(A.)

	Million gallons pumped.						Lift to filters.	Pressure per square inch at sand-washer pumps.	Tons of coal consumed per day.			Station duty per 100 pounds of coal consumed.		
	To filters.			To sand washers.										
	Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.			Maximum.	Minimum.	Average.	Maximum.	Minimum.	Average.
1910.														
July	78.32	56.67	64.22	0.644	0.092	0.436	21.55	120.0	12.0	8.1	9.8	64.6	51.4	58.8
August	74.25	54.79	62.82	.808	.138	.467	21.78	120.0	11.9	8.0	9.8	62.0	54.7	58.5
September	70.33	54.82	62.59	.691	.012	.246	21.46	120.0	12.2	7.7	9.3	63.9	52.7	58.2
October	70.52	54.44	61.05	.466	.198	.278	21.85	120.0	12.4	8.8	10.1	60.4	45.5	54.1
November	63.62	49.52	57.91	.353	.005	.234	20.59	120.0	10.4	8.3	9.3	56.0	49.5	52.9
December	70.76	53.03	62.77	.310	.065	.219	20.73	120.0	11.7	9.2	10.4	58.5	48.2	52.5
1911.														
January	68.20	55.17	60.67	.307	.112	.232	21.49	120.0	11.7	9.0	10.3	56.0	44.8	52.5
February	64.21	51.97	57.18	.457	.028	.283	21.04	120.0	11.6	8.3	10.0	57.7	42.9	51.0
March	58.83	49.57	53.99	.099	.099	.099	19.82	120.0	9.6	7.6	8.5	54.6	48.3	51.3
April	67.63	46.69	55.76	.630	.122	.342	20.87	120.0	13.0	7.9	9.4	59.3	47.7	52.4
May	74.82	54.83	63.04	.740	.008	.441	21.22	120.0	12.1	8.8	10.2	60.2	51.6	55.3
June	74.41	53.63	62.18	.716	.217	.446	25.07	120.0	13.4	9.4	11.5	62.0	51.5	56.0
Fiscal years—														
1905-6 [1]	80.59	57.18	66.07	2.062	.089	.747	21.71	107.4	14.8	6.4	8.9	79.6	48.2	62.8
1906-7	80.29	57.44	66.89	2.120	.023	.580	21.60	120.8	15.0	7.0	10.0	71.6	46.5	58.6
1907-8	80.38	54.35	64.91	.735	.017	.347	22.20	125.0	12.0	7.2	9.6	70.7	51.3	60.3
1908-9	78.93	47.83	61.47	.875	.060	.453	22.52	122.3	13.2	7.0	10.0	74.0	45.7	57.7
1909-10	78.50	48.12	59.19	1.140	.008	.373	21.45	113.3	13.4	7.4	9.8	67.8	44.8	54.0
1910-11	78.32	46.69	60.38	.808	.008	.340	21.46	120.0	13.4	7.6	9.9	64.6	42.9	54.5

(B.)

Fiscal years.	Name of coal used.	Cost per ton.	Duty per 100 pounds of coal consumed.	Cost of coal per million foot-pounds of work performed.
1905-6	Georges Creek Big Vein	$3.34	62.8	$0.00238
1906-7	do	3.43	58.6	.00261
1907-8	do	3.75	60.3	.00278
1908-9	Orenda	3.47	57.7	.00268
1909-10	do	[1] 3.15	54.0	.00255
1910-11	do	[1] 3.19	54.5	.00262

[1] Corrected for increase or decrease in ash and British thermal units as determined by United States Geological Survey.

TABLE 12.

(A) TABLE SHOWING NUMBER OF DEATHS FROM TYPHOID FEVER, BY MONTHS, IN THE DISTRICT OF COLUMBIA FOR THE FIFTEEN FISCAL YEARS PRECEDING THE DATE OF THIS REPORT.

Fiscal years.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
1896-97	8	15	25	25	18	16	13	4	4	4	6	9	147
1897-98	10	16	18	10	9	18	8	4	2	9	6	20	130
1898-99	24	22	22	28	21	16	10	4	7	6	3	6	169
1899-1900	9	38	30	28	27	26	17	6	8	10	5	12	216
1900-1	20	41	29	25	28	17	7	2	8	2	4	10	193
1901-2	16	33	28	21	22	16	19	8	12	9	13	9	206
1902-3	21	39	25	32	19	20	9	5	9	6	6	3	194
1903-4	17	26	18	19	8	14	5	5	6	10	8	8	144
1904-5	16	22	25	14	11	9	11	1	5	7	1	3	125
1905-6 [1]	15	30	23	26	14	6	6	4	5	4	10	9	152
1906-7	21	32	21	25	17	4	7	6	4	6	7	2	152
1907-8	10	18	17	19	11	7	4	1	1	8	8	3	107
1908-9	15	13	23	17	16	13	16	8	3	8	7	7	146
1909-10	12	12	17	12	12	2	3	4	7	5	5	4	95
1910-11	6	12	13	8	9	5	6	4	4	3	8	2	80
Average	14.7	24.6	22.3	20.6	16.1	12.6	9.4	4.4	5.7	6.5	6.5	7.1	150.4

[1] Filtered water supplied since October, 1905.

TABLE 12—Continued.

(B) PRECEDING TABLE OF TYPHOID DEATHS REDUCED TO DEATH-RATES PER YEAR PER 100,000 INHABITANTS.

Fiscal years.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Annual death rate.
1896-97	35	65	100	109	78	70	56	17	17	17	26	39	53
1897-98	43	69	78	43	39	78	34	17	8	38	25	85	46
1898-99	102	93	93	119	89	68	42	17	29	25	12	25	59
1899-1900	37	158	125	116	112	108	69	24	33	41	20	49	74
1900-1	82	167	118	102	114	69	28	8	32	8	16	40	65
1901-2	64	132	112	84	88	64	75	31	47	35	51	35	68
1902-3	83	153	98	126	75	79	35	19	35	23	23	12	63
1903-4	66	100	69	73	31	54	19	19	23	38	30	30	46
1904-5	61	83	95	53	42	34	41	4	19	26	4	11	39
1905-6	56	111	85	97	52	22	22	15	18	15	36	33	47
1906-7	69	105	69	82	56	13	24	20	13	20	24	7	42
1907-8	35	64	60	67	39	25	14	4	4	28	28	11	32
1908-9	53	45	80	60	56	45	56	28	10	28	24	24	43
1909-10	42	42	60	42	42	7	11	14	24	17	17	14	28
1910-11	21	41	45	28	31	17	21	14	14	10	28	7	23
Average	57	96	86	80	63	50	36	17	22	25	24	28	49

10. PRELIMINARY TREATMENT PLANT.

Proposals for furnishing all materials and erecting the building for the preliminary treatment plant were received on August 8, 1910.

William P. Lipscomb & Co. was the lowest bidder, and the contract was awarded to this firm for the sum of $16,272.

The pit, grading, foundations, and drains were done by day labor, and the heating plant, the supply of sulphate of alumina, and pumps were furnished under separate agreement.

Work on the grading and foundation was begun in July, 1910; that under the contract for the building in October of the same year.

In January the building was so nearly completed that sulphate of alumina was applied to the water for a few days during that month.

The cost of the building and coagulant was as follows:

Grading	$1,409.79
Architect's fee and plans	996.22
Inspection	388.70
Foundations and concrete work	1,653.99
Building	16,187.35
Drains	243.12
Heating plant	759.49
Pumps with motors, tanks, and piping	1,310.79
Curbing and roadways	258.64
Sulphate of alumina and handling	4,291.91
Total	27,500.00

12. REMODELING GEORGETOWN RESERVOIR.

The remodeling of Georgetown Reservoir was made necessary by the present system of coagulation in order to flush out the sediment deposited from the coagulated water.

This feature was discussed under the head of "Maintenance and operation," pages 2365 to 2372, Annual Report of the Chief of Engineers, United States Army, 1908. The estimated cost is $108,000, of which $50,000 was appropriated in the District of Columbia appropriation act for fiscal year 1912.

With the funds available for next year this work can be well started, but $58,000 in addition will be needed to complete the work.

13. PARKING GROUNDS, MCMILLAN PARK RESERVOIR.

Complete plans for parking the whole area of McMillan Park have been prepared by Olmsted Bros.

This park has an area of 118 acres, including the reservoir, and when the above plans are fully carried out it will be an attractive park as well as an efficient and economical filtration plant.

The area south of the dam has been graded, 249 trees have been set out, and 424 square yards of sidewalk have been laid.

The appropriation of $2,000 made by act of Congress approved May 18, 1910, was expended during the fiscal year 1911 in prosecution of the project.

With the appropriation $2,000 for fiscal year 1912 it is proposed to extend the walks, cover the whole area with about 1,000 cubic yards of soil, seed it to grass, and purchase part of the shrubs.

In order to complete the whole work of parking it will be necessary to purchase 16,000 cubic yards of soil, 1,252 trees, 20,600 shrubs; to lay 17,300 square yards of concrete walks, move 15,000 cubic yards of earth in grading, and carry out many minor improvements. The time required for doing this work will depend on the rate that funds are appropriated.

14. MCMILLAN MEMORIAL FOUNTAIN.

The act making appropriation for the sundry civil expenses for the fiscal year 1911, approved June 25, 1910, contains the following item under the head of "District of Columbia." "For preparation of site, etc., for fountain in McMillan Park, D. C."

As the appropriation was made under the head of the District of Columbia, the Comptroller of the Treasury rendered an opinion that there was no authority to transfer the appropriation in question from the District of Columbia to the War Department. As the site of the fountain is under control of this office, and as the location of construction of the fountain had been subjects of correspondence between this office, the sculptor, landscape gardener, and McMillan Memorial Association, it seemed advisable to have the work done under this office.

On recommendation of the Chief of Engineers and at the request of the Commissioners, District of Columbia, the work was so assigned, payments being made from the appropriation for the maintenance and operation of the filtration plant, and reimbursements being made to the latter appropriation by transfer of funds from the appropriation for the fountain in the regular manner.

The site of the fountain is at the top of the slope on the west side of First Street NW. in prolongation of the axis of Channing Street.

The preparation of the site, the concrete sidewalks, foundations for the granite approach, and walk around the base of the fountain, the foundation of the fountain, water supply, and drainage was done by day labor. A contract for the construction of the granite approaches and walk around the base of the fountain was made with the Norcross Bros. Co., Worcester, Mass., which company was the lowest bidder for doing the work, their bid being $8,400. All the work by day labor was completed before the end of the fiscal year. The work to be done by contract was incompleted at the end of the year.

The following is a statement of expenditures and liabilities:

Granite work (contract)	$8,400.00
Foundations	1,189.93
Concrete-sidewalk approaches	1,165.36
Resetting curb on First Street	16.59
Soiling and seeding site	2,256.82
Water supply (including meter, $85)	848.25
Drainage	267.05
Engineering and superintendence	751.00
Office expenses	105.00
	15,000.00

15. EMERGENCY FUND.

It was not necessary to make any expenditures from the appropriation of $5,000 for emergency use during the fiscal year 1911. Before the custom of making appropriations of $5,000 for use in emergency was established, when a break or other contingency occurred, necessitating any unlooked-for expenditure, it was necessary to stop ordinary operations so as to cover the extraordinary expense. Should, however, a serious break occur during the last part of the fiscal year, the funds available might be inadequate and a disastrous condition result. A continuation of the appropriation of $5,000 is recommended to constitute an emergency fund.

TABLE 13.—*Appropriations for the Washington Aqueduct, District of Columbia filtration plant, dates of acts, and reversions to the Treasury.*

June 6, 1900		$200,000.00
Mar. 1, 1901		500,000.00
July 1, 1902		600,250.00
Mar. 3, 1903		600,000.00
Apr. 27, 1904		1,568,155.00
June 27, 1906		80,000.00
Mar. 2, 1907		90,000.00
May 26, 1908		82,000.00
Mar. 3, 1909		82,000.00
May 18, 1910		82,000.00
Total		3,884,405.00
Reverted to Treasury	$44,166.63	
Reappropriated under head of parking	[1] 6,000.00	
Outstanding liabilities June 30, 1911	9,540.44	
		59,707.07
Net amount expended		3,824,697.93
(a) For construction		3,378,845.99
For maintenance and operation		445,851.94
(b) Paid by United States		1,912,348.965
Paid by District of Columbia		1,912,348.965

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[1] Unexpended balance of appropriation of $90,000, act of Congress Mar. 2, 1907, reappropriated for parking grounds, McMillan Park Reservoir, and expended under head of "Washington Aqueduct."

Expenditures on account of the Washington Aqueduct, exclusive of the works for the purification of the water supply.

Periods.	For construction.	For operation, maintenance, and repairs.	Paid by—	
			United States.	District of Columbia.
1850 to June 30, 1910	$7,784,824.44	$1,075,645.27	$6,335,387.14	$2,525,082.57
Fiscal year 1911.				
Outstanding liabilities, 1910				
Expended in 1911	100.00	4,266.65	2,183.33	2,183.32
Parking McMillan Park	2,000.00		1,000.00	1,000.00
Metering Government buildings	2,992.04		1,496.02	1,496.02
Preservation and repair of Cabin John Bridge		913.28	456.64	456.64
Maintenance, 1911		30,453.97	15,226.98	15,226.99
Total	7,789,916.48	1,111,279.17	6,355,750.11	2,545,445.54

Total expended to June 30, 1911, $8,901,195.65.

Expenditures on account of works for purification of water supply.

Fiscal years.	Construction.	Operation, maintenance, and repair.
1900–1910	$3,378,845.99	$363,031.71
Fiscal year 1911.		
Outstanding liabilities, 1910		10,360.67
Operation, maintenance, etc		72,459.56
Preliminary treatment plant	23,208.09	3,457.57
Total	3,402,054.08	449,309.51

Total expended to June 30, 1911 (one-half paid by the United States and one-half paid by the District of Columbia), $3,851,363.59.

CONTRACTS IN FORCE.

Contractor: Merchants Coal Co. of Pennsylvania, Baltimore, Md., for coal.
Amount: 3,600 tons (10 per cent more or less).
Date of contract: August 31, 1910.
Approved: September 19, 1910.
Date for commencement: October 16, 1910.
Date for completion: June 30, 1911.
Rate: $3.29 per ton.

Contractor: Camden Iron Works, Philadelphia, Pa., for iron castings, etc.
Amount: 1,000 castings (10 per cent more or less); 17,000 bolts (10 per cent more or less).
Date of contract: June 8, 1911.
Approved: (Emergency contract.)
Date for commencement: July 18, 1911.
Date for completion: October 8, 1911.
Rate: $46.50 per ton for castings; $4.07 per 100 for bolts.

Contractor: Skinker & Garrett, Washington, D. C., for extension to storehouse.
Amount: $2,259.
Date of contract: June 12, 1911.
Approved: (Emergency contract.)
Date for commencement: July 3, 1911.
Date for completion: August 12, 1911.

Contractor: Merchants Coal Co. of Pennsylvania, Baltimore, Md., for coal.
Amount: 3,600 tons (10 per cent more or less).
Date of contract: June 15, 1911.
Approved: (Not approved by end of fiscal year.)
Date for commencement: After July 1, 1911.
Date for completion: June 30, 1912.
Rate: $3.17 per ton.

APPENDIX E E E.

IMPROVEMENT AND CARE OF PUBLIC BUILDINGS AND GROUNDS IN THE DISTRICT OF COLUMBIA—WASHINGTON MONUMENT.

REPORT FOR THE FISCAL YEAR ENDING JUNE 30, 1911. OFFICER IN CHARGE, COL. SPENCER COSBY, UNITED STATES ARMY.

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Office of Public Buildings and Grounds,
Washington, August 11, 1911.

General: I have the honor to submit the following report of operations of the office of public buildings and grounds in the District of Columbia under the Chief of Engineers during the fiscal year ending June 30, 1911:

The various duties assigned to the officer in charge of public buildings and grounds during the year were as follows:

1. Maintenance, care, and repair of the Executive Mansion, grounds, and greenhouses.
2. Improvement, policing, care, and maintenance of various parks and reservations in the District of Columbia.
3. Improvement, care, and maintenance of the portion of Potomac Park west of the railroad embankment.
4. Care and maintenance of the Washington National Monument.
5. Care and maintenance of the propagating gardens.
6. Care of the building No. 516 Tenth Street NW., where Abraham Lincoln died.
7. The preservation, care, and safety of buildings occupied by the War Department in the District of Columbia, except State, War and Navy Department Building.
8. Care and repair of the Government telegraph line connecting the Capitol with the various departments and Government Printing Office.
9. Care and maintenance of the highway bridge across the Potomac River, District of Columbia.
10. Furnishing and planting trees, shrubs, etc., in the grounds of the Library of Congress, of the Capitol, and of executive departments.
11. The immediate charge of the banks of the Potomac River from the north line of the arsenal (or Washington Barracks) grounds to the southern curb line of N Street SW.

12. Care of the monument at Wakefield, Va., the birthplace of Washington, and the iron pile dock at the mouth of Bridge Creek, Va.

Executive and disbursing officer of the following commissions:

13. Grant Memorial Commission.
14. Von Steuben Statue Commission.
15. Barry Statue Commission.
16. John Paul Jones Statue Commission.
17. Columbus Memorial Commission.
18. In charge of the monument at Fredericksburg, Va., to the memory of Gen. Hugh Mercer.
19. Member of the commission created by the public buildings act approved May 30, 1908, to cause plans and estimates to be prepared for a suitable armory for the National Guard of the District of Columbia.
20. Secretary, executive and disbursing officer of the Commission of Fine Arts, created by act approved May 17, 1910.
21. Member of board of engineers to prepare and approve plans for the reclamation and development of the Anacostia River and Flats.
22. Military aide to the President.

1. EXECUTIVE MANSION, GROUNDS, AND GREENHOUSES.

Care of Mansion.—The work required to maintain the house in good condition was carried on in a systematic manner throughout the year. The hardwood floors in particular require much attention in the way of cleaning, waxing, etc., and this was done with regularity. The tile floors in the entrance vestibule and in the main corridor on the first floor were also given constant attention.

General repairs.—Minor repairs were made to doors, windows, and floors. New doors were made for the exit from the attic to the roof. Old plastering in the elevator and light shafts was cut out and replaced; some plastering repairs were also made in the west terrace. The roofs of the east and west terraces were repaired. One room in the west terrace was fitted up for the use of the extra clerks in the executive offices; the plaster and woodwork were repaired, electric lights installed, and the walls, ceiling, and woodwork given three coats of paint. The lockers for the house servants were moved from the room next to the bouquet room, and that room was fitted up for use as a storage room in connection with the bouquet room. A new marble mantel was placed in the southeast corner of the East Room to replace a badly cracked one that was taken out. The electric dumb waiter was repaired. All fire-alarm boxes were tested.

Heating.—The heating plant was looked after and kept in proper order.

Plumbing.—The plumbing fixtures were examined regularly and maintained in good order.

Lighting, etc.—The electric plant and wiring were overhauled and maintained in good condition. All of the chandeliers and fixtures were thoroughly cleaned. Burned out electric lamps were replaced with new, and new shades put on where required. All the electric-bell wiring was overhauled.

Elevator.—Necessary attention was given to the elevator and to its operating machinery. All bearings were repacked and the controller cable was repaired.

Lightning protection.—A new system of lightning protection was installed on the Mansion in July, 1910. The work was done under contract. The old zinc and lead rods were removed from the house and new copper cables, connected to large copper earth plates, put in place. These cables were connected to 100 points on the roof of the house. The rods and points are mechanically and electrically connected to the house.

Silver closet.—A silver closet, with double steel doors and a complete set of shelves and cupboards, was built in one end of the storeroom on the ground floor.

Telephone system.—A new house telephone system was installed. A new telephone annunciator was placed in the ushers' room, and the head usher's desk was connected with all the house telephones.

Painting.—The following portions of the Mansion were painted: On the second floor the baseboard in the President's dressing room, in the east end of the corridor, and in the northeast and northwest bedrooms, the blind door of the library, the ironwork of the small private stairway, the wall and two windows in the elevator shaft, and two skylights over that shaft, and the walls of one room in the attic (whitewashed). On the first floor the woodwork in the blue and red rooms, the walls, ceiling, door frames, and door in the corridor. On the ground floor the carpenter work of the new silver closet, the storeroom, the walls, ceiling, and woodwork in the steward's room, and two sides of the wall under the west terrace.

Furniture and furnishings.—Furniture was repaired and the frames rubbed down wherever necessary. One sofa, 2 side chairs, 1 armchair, and 1 corner chair in servants' room in attic were reupholstered and covered with new material. The tops of the 2 large mahogany dining-tables were cleaned off down to the natural wood, shellacked, varnished, and rubbed down. In July all carpets and portieres were taken up, cleaned, and packed away for the summer. The walls of the green, blue, and red parlors were cleaned and a white covering put on for the summer. The animal heads in the State Dining Room were cleaned and covered. All furniture was cleaned and linen covers put on. Mirrors and oil paintings were covered with netting. In September the temporary white covering was taken down from the walls, the furniture covering removed, all the floors cleaned and waxed, and the house was put in good condition for the return of the President on September 25. In October all carpets were put down and portieres hung.

Social functions.—During the year this office did more or less work, as called upon, for six State dinners, thirteen small dinners, five musicales, four evening receptions, three day receptions, three dances, one ball, four garden parties, one tea, and the President's silver wedding anniversary. For the receptions the necessary rearrangement of furniture was made and attendants were provided for the hat boxes, dressing rooms, and supper room. For the dinners the tables were put in place and the usual floral decorations provided. Immediately after each of these functions the house was restored to its usual condition. Temporary lines of telephones were put up for use in calling carriages at the evening functions, and attendants provided for operating them. A temporary inclosure of wood was erected on the roof of the East Terrace, just outside of the East Room windows, in which the Marine

Band played for one of the dances. A portable platform was made for the north end of the East Room for use at musicales.

Inventory of property.—The sundry civil act approved June 25, 1910, provides:

> SEC. 9. Hereafter the steward, housekeeper, or such other employee of the Executive Mansion as the President may designate, shall, under the direction of the President, have the charge and custody of and be responsible for the plate, furniture, and public property therein, and shall, before entering upon the duties of the office, give bond for the faithful discharge thereof, said bond to be in the sum of ten thousand dollars, and be approved by the Secretary of War. And hereafter a complete inventory, in proper books, shall be made annually in the month of June, under the direction of the officer in charge of public buildings and grounds, of all the public property in and belonging to the Executive Mansion, showing when purchased, its cost, condition, and final disposition. This inventory shall be submitted to the President for his approval, and shall then be kept for reference in the office of public buildings and grounds, which shall furnish a copy thereof to the steward, housekeeper, or other employee responsible for the property.

Under the above provision of law, a complete inventory of the public property in the White House has been made, under the direction of this office, by Mr. W. McC. Sauber, an expert who was detailed for the purpose from the office of the Supervising Architect of the Treasury. This inventory has been approved by the President. It is in duplicate and the copies will be disposed of in accordance with the law quoted above.

Executive Office Building.—The usual care was extended to this building. Minor repairs were made to doors, windows, woodwork, plumbing fixtures, and heating apparatus. A partition was built across the south end of the clerks' room to form a new room for the telegraph and telephone service. Arched openings were made in the wall separating the secretary's room from the old telegraph room, in order that the latter might be used as an additional room for the secretary. A skylight was placed in the roof to give light and ventilation to the new telegraph room. The lighting circuits in this room and in the clerks' room were changed. Systematic attention was paid to the floors, which were cleaned and waxed whenever necessary. Some painting was done in the lobby and in the passageway from the West Terrace, and the walls and woodwork in the secretary's new room and in the press room were given two coats of paint. Old burned-out electric lamps were replaced with new, and all the electric bells and buzzers were put in good order. A new wooden case for files and books was erected in the clerks' room, and facilities for supplying additional heat to the room were provided. The headpieces of the marble mantel in the President's room and of the stone mantels in the Cabinet and secretary's rooms were replaced with larger pieces of stone. In October the wire screens were taken down from the windows and stored. Extra ventilators were purchased for use in the Cabinet Room. One new 4-light chandelier was put up in the congressional waiting room.

Stable of Executive Mansion.—The plumbing and lighting fixtures were maintained in good order. The sundry civil appropriation act, approved March 4, 1911, appropriated $1,000, or so much thereof as may be necessary, for the removal of this stable and for such grading, soiling, seeding, and sodding as may be incidental thereto. The act further requires that the Quartermaster General of the Army shall provide suitable accommodations for the horses, carriages and other vehicles of the President and of the Executive Office, in the stables maintained in the District of Columbia by and for the use of his department. Under the authority thus granted, the horses were removed early in June, 1911, from the Executive stable to the stables of the Quartermaster's Department, located at Nineteenth Street and Virginia Avenue NW. It is anticipated that accommodations will be provided early in July for the vehicles in the Executive stable, and as soon as these are removed proposals will be invited for the removal of the President's stable, including the frame building in the rear.

Greenhouses, Executive Mansion.—These houses are located at the propagating gardens in the Monument Grounds. Necessary attention was given to the large collection of plants, which were maintained in good condition. The flues of boilers were cleaned, the boilers repaired, and leaking pipe joints recalked. Some old water supply pipe was replaced with new, and in two of the houses changes were made in the hot-water pipes which heat the buildings, in order to improve the circulation. One cold frame 80 feet long by 6 feet wide was reerected. The tubs and saucers that are used for plants in the Executive Mansion were cleaned and painted.

One of the greenhouses was reconstructed and a concrete stoke hole built to contain the boiler intended to heat both this house and a new house which was built for the propagating gardens.

Grounds of Executive Mansion.—Constant attention was given to these grounds. Lawns were mown, and roads, walks, sidewalks, pavements, gutters, and drain traps regularly cleaned. Eight large evergreens were planted along the drive leading to the north entrance of the mansion. Well rotted stable manure was spread on portions of the lawns in December; this was raked in in the spring and the refuse removed. In March shredded cattle manure was spread over the portions not covered with stable manure. Bare places in the lawns were sown with grass seed. The privet hedge inside the iron fence inclosing the south grounds was extended northward, on the west side, from the southwest gate to the office building, and on the east side from the southeast gate to the mansion, 800 plants being used. In May the elm trees were sprayed with a solution of arsenate of lead to protect them from being defoliated by the elm-leaf beetle. Eighteen small spruce trees were planted in the hedge south of the office building. All the privet hedges were trimmed.

Changes were made in two of the roadways south of the mansion. The east road was given a better curve and the west road was cut across the lawn to match the east one. The new portions of these roads were built with broken gneiss surfaced with crushed trap rock. About 700 square yards of sod were laid, 11 catch basins built, 45 feet of 6-inch terra-cotta pipe put down, and 2,437 linear feet of brick gutter relaid. The gravel was removed from the sections of roads to be abandoned, and was replaced with clay, which was covered with soil and seeded.

In accordance with custom, the grounds were opened to the children on Easter Monday, April 17, from 9 a. m. to 1 p. m., for the egg rolling. The grounds were afterwards cleaned and the accumulated rubbish removed.

In the colonial gardens south of the east and west terraces the bay trees were cared for, hedges and vines trimmed, rose bushes and plants pruned, lawns mown and edged, flower beds kept in good order, weed growth removed from gutters, and walks resurfaced with gravel and rolled. In November the summer flowering plants were removed from the beds, which were spaded and replanted with spring flowering plants and bulbs. In the autumn the bay trees on the terraces of the mansion were removed to the greenhouses for the winter, and evergreens put in their places on the terraces. In May the evergreens were taken back to the greenhouses and the bay trees replaced on the terraces. Forty boxes filled with summer plants were also placed on the terraces in May.

2. PARKS AND PUBLIC RESERVATIONS IN THE DISTRICT OF COLUMBIA.

For the purposes of administration all the parks under this office are divided into four divisions, viz:

1. Northwest division: All west of North Capitol Street and north of B Street north.
2. Southwest division: All west of North and South Capitol Streets and south of B Street north, except Potomac Park and the Monument Grounds.
3. East division: All east of North and South Capitol Streets.
4. Potomac Park division, including the Monument Grounds.

The area covered by the park spaces of the District of Columbia under the charge of this office is about 717 acres.

There are, in all, 346 reservations, varying in size from 250 square feet to 302 acres. They are classified as follows:

	Number.	Acres.
Fully improved	110	339
Partially improved	131	351
Unimproved	105	27
Total	346	717

During the year three park spaces were added to the system by the transfer to the Chief of Engineers by the Commissioners of the District of Columbia of the following parcels of ground under authority granted by section 2, paragraph (*b*), of the act of Congress approved July 1, 1898:

Number given to reservation.	Location of reservation.	Area.	Date of transfer.
310a	Park Road between Mount Pleasant and Seventeenth Streets NW	*Sq. ft.* 5,024	Apr. 5, 1911
282a	Florida Avenue, Twelfth and K Streets NE	707	Apr. 20, 1911
324	Montrose Park, between R and T Streets at Thirty-first Street NW	[1]15.69	June 15, 1911

[1] Acres.

The area of Potomac Park was also increased by the transfer, on January 13 and February 2, 1911, by the commissioners to the Chief of Engineers of certain land just south of Upper Water Street between Twenty-fifth and Twenty-sixth Streets and of two small areas forming the extreme southern ends of Twenty-fifth and Twenty-sixth Streets NW., the total area thus transferred being 61,340 square feet.

There was also transferred to the Chief of Engineers by the commissioners the following areas no longer needed for sidewalk purposes:

January 20, 1911, a strip of ground at the east end of reservation No. 76, at Massachusetts Avenue, Third and H Streets NW., containing 191.8 square feet.

May 19, 1911, reservation No. 25, Pennsylvania Avenue, Twenty-fourth and K Streets NW., a strip of ground containing 202.33 square feet.

May 19, 1911, reservation No. 27, Pennsylvania Avenue, Twenty-second and K Streets NW., a strip of ground containing 829.11 square feet net.

The following-described ground was transferred by the Chief of Engineers to the Commissioners of the District of Columbia under the authority of section 4 of the law above quoted:

September 2, 1910, reservation 65*a* (Highland Terrace), Massachusetts Avenue and Fourteenth Street NW., an area at the east end of the reservation containing 320 square feet, for street purposes. This reduced the area of the reservation to 8,130 square feet.

January 20, 1911, reservation No. 75, Massachusetts Avenue and H Street between Third and Fourth Streets NW., a strip along the Massachusetts Avenue side containing 1,872 square feet, for sidewalk purposes. This reduced the area of the reservation from 5,497 to 3,625 square feet.

January 20, 1911, reservation No. 76, Massachusetts Avenue, and H Street between Third and Fourth Streets NW., a strip along the Massachusetts Avenue side containing 1,791.6 square feet. This reduced the area of the reservation from 5,079 to 3,287.4 square feet, which was increased to 3,479.2 by the addition of 191.8 square feet as above reported.

May 19, 1911, two small areas, one at the Pennsylvania Avenue and Twenty-fourth Street corner of reservation No. 25 and one at the Twenty-second and K Streets corner of reservation No. 27. These reservations now contain 1,162.67 square feet and 1,402.89 square feet, respectively.

During the fiscal year part of the $26,000 appropriated for "Improving various reservations" was devoted to improving three reservations (Nos. 33*a*, 133, and 323, containing 0.243 acre) hitherto unimproved. The improvements consisted in a general way in grading, soiling, seeding, and introducing water.

In addition to the three reservations improved, the macadam driveway along the southern half of B Street north, east of Virginia Avenue, was extended from Sixteenth to Fifteenth Street west. Additional work for the improvement of the interior portion of Potomac Park was accomplished, and the roads of approach to the bridge across the inlet to the tidal basin were macadamized.

MAINTENANCE OF IMPROVED PARKS.

The improved parks and park spaces were maintained in good condition during the year. The work consisted in mowing and raking lawns, edging their borders, sodding or seeding bare places, planting and caring for flower beds, pruning trees and shrubs, trimming hedges, removing dead trees, cleaning gutters and drain traps, sweeping paved roads and walks, and raking gravel walks and removing weed growth from them.

The work of exterminating caterpillars continued throughout the year. During the fall and winter all cocoons within reach on the trees were burned with a painter's torch. During May a band of tree tanglefoot was put around each large tree, about 6 feet from the ground, this effectually preventing caterpillars from crawling up the tree to make their nests. The caterpillars were burned on the trunks of the trees below the tanglefoot as fast as they appeared.

All elm trees that were infected by the elm-leaf beetle were sprayed with a solution of arsenate of lead during the month of May.

The old-style grates on the drain traps were either fastened down securely or replaced by new grates and frames. In December 1,000 cubic yards of well-rotted stable manure were spread on some of the lawn surfaces, and in March 35 tons of shredded cattle manure, 20 tons of air-slaked lime, and 5 tons of bone meal were spread on lawn surfaces not manured in December.

In the autumn some of the flower beds were planted with pansy plants and some with flowering bulbs for early spring bloom. In these plantings 28,000 pansies and 33,500 bulbs were used. In the spring the beds were planted with 563,800 bedding plants and 5,900 tropical plants for summer decoration. These beds were protected in most cases by hooped irons placed around them. Eighteen vases were stocked with plants for summer decoration.

The special efforts made by this office during recent years to renew the bare places and worn borders on the lawns by resodding have been continued, and during the year 13,092 square yards of sod were used for the purpose, vastly improving the appearance of the parks.

In addition to the general work referred to above, the following special work was done:

NORTHWEST DIVISION.

Du Pont Circle.—Worn places in the asphalt walks, covering an area of 440 square yards, were resurfaced. Owing to the unsatisfactory condition of the foundation of the Du Pont statue, it was found necessary to take down both statue and pedestal, put in a new concrete foundation, and reset the statue. This work was done in March, and when completed the pedestal was thoroughly cleaned.

Farragut Park.—Repairs were made to the asphalt walks; the area resurfaced amounted to 190 square yards. It was found that the statue of Farragut had never been bolted down to the pedestal and was considerably out of plumb, probably due to the action of frost. In March the statue was lifted from the pedestal and all mortar thoroughly cleaned from the base of the statue and the top of the pedestal. The statue was then reset and bolted down with two ⅝-inch copper bolts, after which the base was filled with Portland cement grout.

Franklin Park.—Washouts in the gravel walks and 100 square yards of worn places in the asphalt walks were repaired. The sand box was filled with fresh sand from time to time during the year, as required, for the children to play in.

Iowa Circle.—Worn places in the asphalt walks were repaired; the area resurfaced amounted to 370 square yards.

Judiciary Park.—One hundred and eighty square yards of worn places in the asphalt walks and 50 square yards of worn places in the F Street roadway were resurfaced. The water pipes were extended by laying 260 feet of 1¼-inch galvanized-iron pipe.

Lafayette Park.—Worn places in the asphalt walks were repaired; the area resurfaced amounted to 125 square yards.

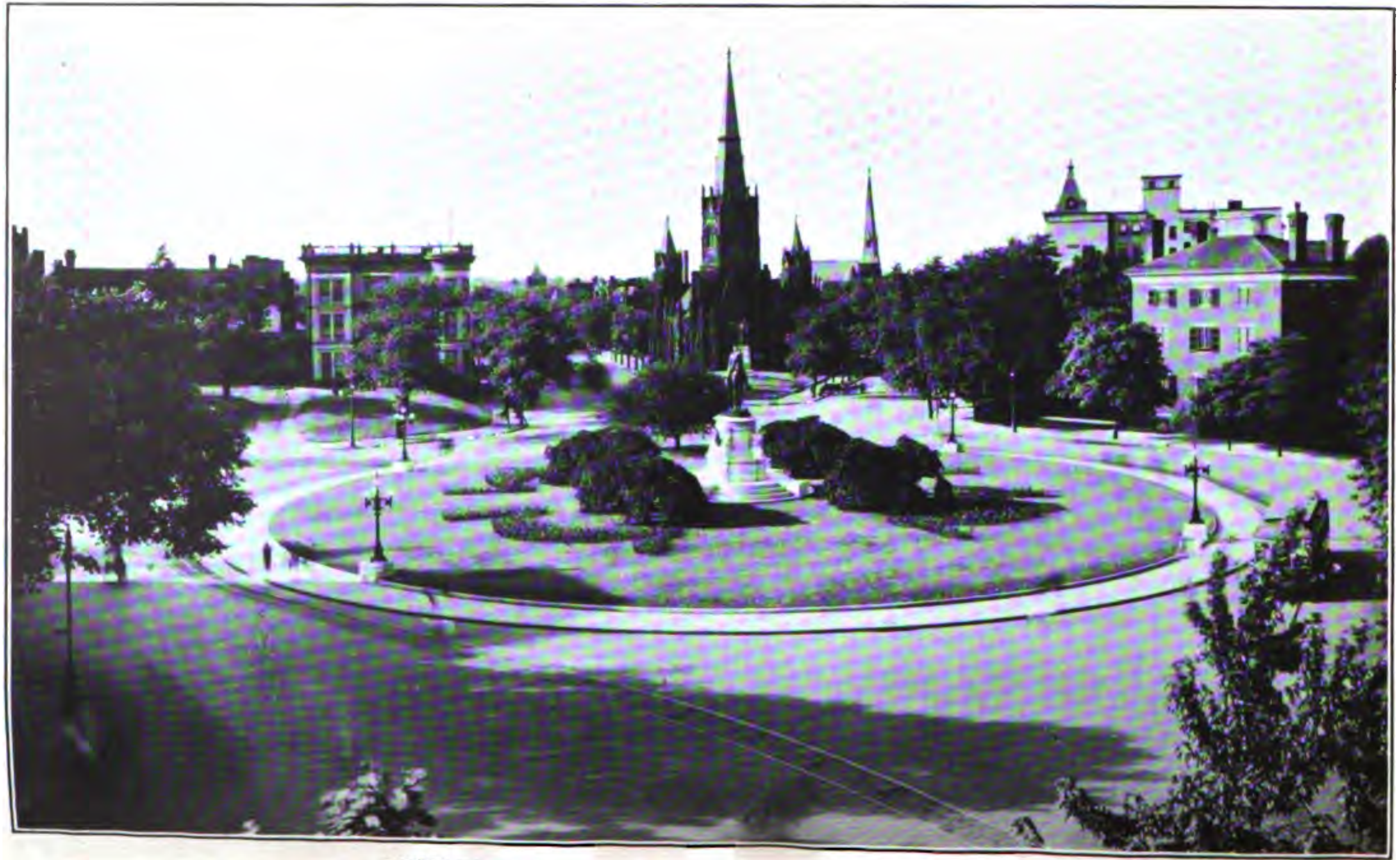
McPherson Park.—Worn places in the asphalt walks were repaired; the area resurfaced amounted to 130 square yards. The shape of the four flower beds near the statue was changed from circular to triangular. The shrubbery around these beds was lifted and sent to the propagating gardens.

Montrose Park (reservation 324) between R and T Streets, at Thirty-first Street, Georgetown.—In the District of Columbia appropriation act, approved March 2, 1911, Congress authorized and directed the Commissioners of the District of Columbia to acquire for a park, by purchase or condemnation "the tract of land known as Montrose, lying immediately north of Road or R Street and east of Lover's Lane on Georgetown Heights, containing 16 acres, more or less, at an expense not exceeding $110,000." The act appropriates the sum mentioned for the purchase of the land and provides: "That the public park authorized and established by this act shall become a part of the park system of the District of Columbia and be under the control of the Chief of Engineers of the United States Army." In accordance with this provision, the Commissioners of the District, after completing the purchase, wrote, on June 9, 1911, to the Chief of Engineers requesting that he assume jurisdiction over the park. By letter of June 15, 1911, to the commissioners, the Chief of Engineers accepted the transfer.

This office immediately made an examination of the park, which was found to be in a very unkempt condition. As there were no funds available for cleaning up the grounds, that work will have to be deferred until the next fiscal year, when the new appropriation for the care and maintenance of various reservations will become available. An estimate of $10,000 is submitted with this report for commencing the improvement of this park and for its care and maintenance during the fiscal year 1913.

President's Park (grounds south of Executive Mansion inclosure).—Broken places and small holes in the surface of the macadam road around the ellipse were filled with trap-rock screenings, oiled, and rolled. In September all of the macadam roadways, with the exception of the small branch road leading out to Seventeenth and B Streets, were oiled, covered with trap screenings, and rolled. The area so treated was 28,500 square yards. In May, 1,500 square yards of roadway was reoiled and covered with coarse sand. Low places in the bridle paths were raised with cinders and brought to proper grade and six new wooden bridges were made and placed where the path crosses the gutters. Repairs were made to the asphalt pavement of West Executive Avenue; the area resurfaced amounted to 20 square yards. The south end of the branch road leading to Seventeenth and B Streets was raised to meet the new grade of B Street, covered with broken stone, and rolled. One hundred and twenty-four feet of cobblestone gutter was relaid. The grade of the park just north of B Street was raised, graded, covered with soil, seeded, harrowed, and rolled. The necessary flagstones in the sidewalks on both sides of West Executive Avenue were taken up, holes dug, and 36 oak trees planted.

Sheridan Circle.—Four cartloads of gravel were used in filling washouts in the walks.



LANDSCAPE IMPROVEMENTS AT THOMAS CIRCLE. VIEW LOOKING NORTH.

Scott Circle.—The four flower beds in this circle were sodded over and in their place a 5-foot bed was made around the circle just inside the coping. In April this was planted with ivy, with a box edging around it.

Thomas Circle.—The grade of this circle was raised to conform to the new coping set by the city. The general landscape design was improved as follows: The four candelabra light posts were moved to points on the diagonals of the circle so as not to obstruct the main views of the monument; the eight circular flower beds were sodded over; and four new garland-shaped flower beds were constructed in their stead. A photograph showing the improved circle accompanies this report.

Washington Circle.—Repairs were made to worn places in the asphalt walks; the area resurfaced amounted to 45 square yards. The woodwork of the lodge was thoroughly repaired and painted. An 8-inch cement coping 975 feet in length was constructed around this circle in April by the District government. The ground inside this coping was raised to grade by this office, covered with soil, and sodded. A new entrance was put in on the east side of the park.

Reservation 25 (Pennsylvania Avenue, Twenty-fourth and K Streets NW.).—The post and chain fence was removed from around this reservation and an 8-inch cement coping 252.5 feet in length constructed in place of the fence.

Reservation 27 (Pennsylvania Avenue, Twenty-second and K Streets NW.).—The post and chain fence was removed from around this reservation and an 8-inch cement coping 248.5 feet in length constructed in its place.

Reservation 33a (Pennsylvania Avenue, Thirteen-and-a-half and E Streets NW.).—An 8-inch cement coping 170 feet in length was contructed around this reservation, the grade raised, and the reservation soiled and sodded.

Reservation 58 (Massachusetts Avenue, Twenty-first and Q Streets NW.).—The flower bed in this reservation was done away with and a mass plantation of rhododendrons substituted. The bed for this planting was especially prepared with well-composted manure and rich soil.

Reservation 59 (Massachusetts Avenue, Twentieth and P Streets NW.).—The watchman's lodge was moved from the point of the triangle to the southwest corner. New sills were placed under the lodge and all the woodwork was repaired and repainted. The ground around the old and the present locations of the lodge was graded and sodded. A thick background of deciduous shrubs was planted on the southwest and north sides of the fountain.

Reservation 62 (Massachusetts Avenue,, Rhode Island Avenue, and Sixteenth Street).—The general design of this reservation was changed to give a more pleasing landscape setting to the Webster Statue. An evergreen background of hemlock was planted, two large privet bushes were removed from the back of the statue and placed one at each side to frame it, and two long beds of rhododendrons were planted to carry out the same effect. The direction of two of the asphalt walks was changed to give a broader effect to the foreground of the statue. Forty and two-tenths square yards of new asphalt walk and 18 linear feet of cement coping were constructed. The area covered by the old walks was sodded. Several overgrown shrubs were removed from the area in front of the statue, which was then planted with a 5-foot border of English ivy edged with dwarf box, a large-pattern flower bed in the form of a shield being constructed in the center and the remainder of the area sodded over. A view of the improved reservation accompanies this report.

Reservation 64 (Massachusetts and Rhode Island Avenues and Sixteenth Street N W.).—Two large privet bushes were removed from the southeast corner of this park, one to the north and the other to the south of the Hahnemann statue. This work was done in accordance with a new landscape plan which proposes a unity in the design of Reservations Nos. 62, 63, and 64, which group together as Scott Circle.

Reservation 68 (Massachusetts Avenue and L Street, between Eleventh and Twelfth Streets N W.).—Worn places in the asphalt walks were repaired; the area resurfaced amounted to 50 square yards.

Reservation 69 (Massachusetts Avenue and L Street between Tenth and Eleventh Streets N W.).—Thirty-five square yards of worn places in the asphalt walks were resurfaced.

Reservation 75 (Massachusetts Avenue, Fourth and I Streets N W.).—The iron pipe and post fence around this reservation was removed and 319 linear feet of 8-inch cement coping constructed in its place. The grade of the reservation was raised to the top of the new coping and the ground soiled and sodded.

Reservation 76 (Massachusetts Avenue, Fifth and I Streets N W.).—The iron pipe and post fence around this reservation was removed and 304 linear feet of 8-inch cement coping constructed in its place. The grade of the reservation was raised to the top of the new coping and the ground soiled and sodded.

Reservation 133 (New Hampshire Avenue, Twenty-sixth and G Streets N W.).—This reservation was graded, covered with soil, seeded, and rolled, and a border of sod 2 feet wide laid around it. Water was introduced, 58 feet of 1-inch lead pipe and 60 feet of 1¼-inch galvanized-iron pipe being laid.

Reservation 143a (New Hampshire Avenue, Eighteenth and Q Streets N W.).—Reservation 143b (New Hampshire Avenue, Eighteenth and Corcoran Streets N W.).—Evergreens were planted in these small reservations.

Reservation 144 (New Hampshire Avenue, Seventeenth and S Streets N W.).—Repairs were made to the asphalt walks; the area of worn places resurfaced was 15 square yards.

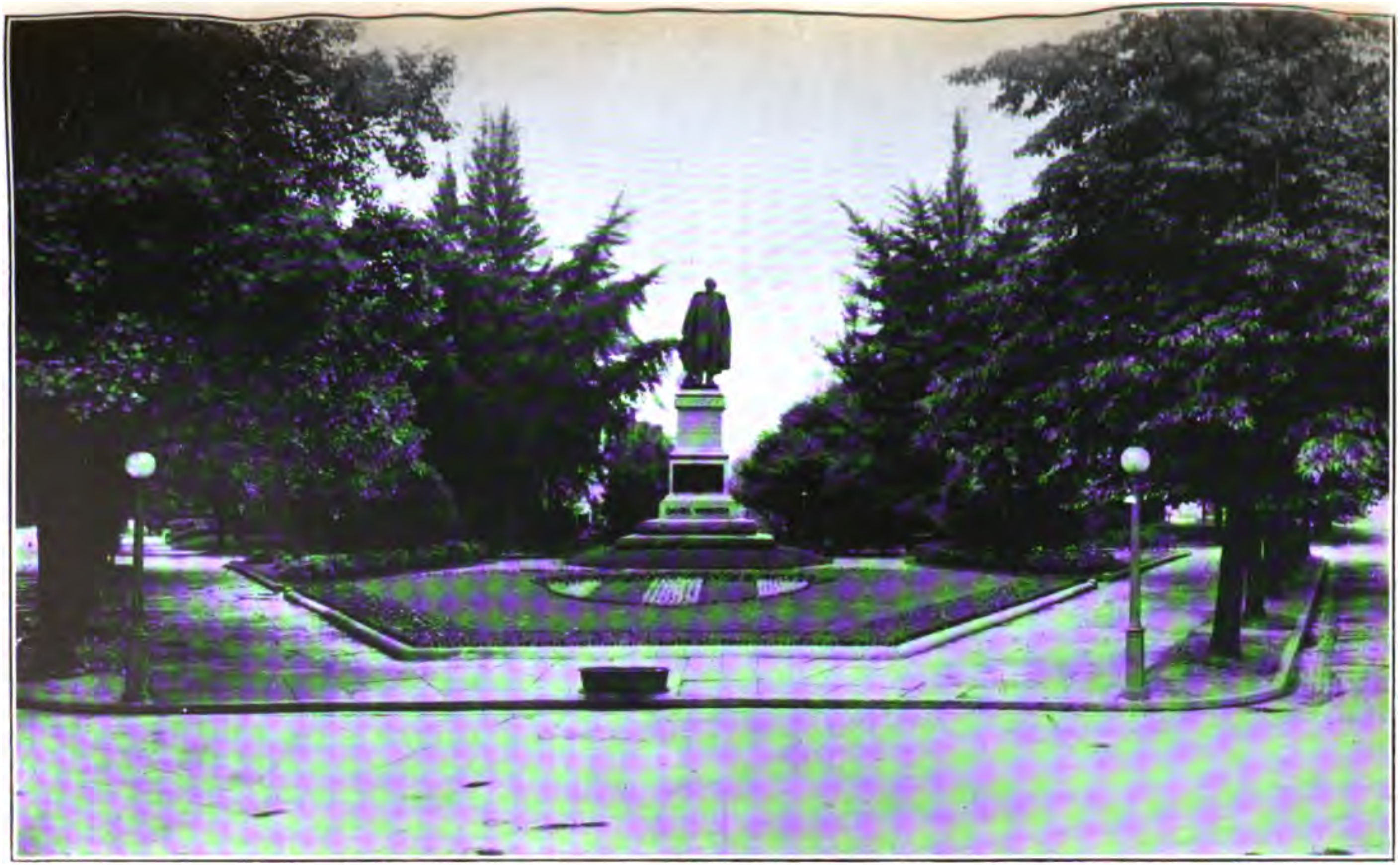
Reservation 150a (Connecticut Avenue, Eighteenth and N Streets N W.).—Three informal beds were planted in this reservation, two of them with small shrubs and one with tree ivy.

Reservation 151 (Rhode Island Avenue and M Street N W.).—The post and chain fence was removed from around this reservation and 200.5 feet of 8-inch cement coping constructed in its place.

Reservation 154 (Rhode Island Avenue, Twelfth and P Streets N W.).—The post and chain fence was removed from around this reservation and an 8-inch cement coping 484 feet long constructed in place of it.

Reservation 173 (New York Avenue and I Street between Eleventh and Twelfth Streets N W.).—Repairs were made to worn places in the asphalt walks; the area resurfaced was 20 square yards.

Reservation 179 (New York Avenue, Third and M Streets N W.).—Three hundred and twelve linear feet of 8-inch cement coping and four cement posts were constructed around this reservation.



REVISED LANDSCAPE SETTING OF WEBSTER STATUE. VIEW FROM SCOTT CIRCLE, LOOKING WEST.

Reservation 184 (*New York Avenue, First and O Streets NW.*).—The District Commissioners laid a new cement sidewalk on the north (O Street) side of this reservation. The iron post and chain fence on that side, being 3 inches inside the line of the new pavement, was moved back by the contractors. The posts were subsequently properly reset by employees of this office. One post at the apex of the reservation was taken up and removed.

Reservation 305a (*Columbia Road and Nineteenth Street NW.*).—An 8-inch cement coping, 300.5 feet in length, was constructed around this reservation.

Reservation 323 (*New Hampshire Avenue and Rock Creek Church Road*).—This reservation was graded, soiled, seeded, and rolled and a 2-foot border of sod laid around it.

SOUTHWEST DIVISION.

Henry Park.—Five thousand three hundred and twenty-five square yards of gravel road was covered with crushed trap rock and thoroughly rolled.

Smithsonian grounds.—Repairs were made to the asphalt walks; the area resurfaced amounted to 70 square yards. Two thousand one hundred and eighty square yards of gravel road was covered with crushed trap rock and thoroughly rolled. The water service was extended in the northwest corner of the grounds, 790 feet of 2-inch galvanized-iron pipe and 983 feet of 1¼-inch galvanized-iron pipe being used for the purpose. Fourteen outlet pipes for hose valves were put on this extension. At the request of the secretary of the Smithsonian Institution, this office planned and supervised the construction of the roads and walks around the new building of the National Museum, erected opposite Tenth Street just south of B Street, the old roads and walks in the vicinity having been destroyed during the erection of the new building. The work was commenced in October, 1910, and completed by June 30, 1911.

EAST DIVISION.

Folger Park.—Low limbs on the trees which interfered with travel were pruned.

Garfield Park.—In July the cement wading pool was cleaned twice each day, the grounds were cleaned daily, and the playgrounds in the east section sprinkled with water as required. Repairs were made to the cinder paths. Five additional settees were placed in the park. Twenty Lombardy poplars were planted in the southwest corner. In June 416 feet of stone wall and 112 feet of cement steps were constructed. The wall and steps form a part of the playground in a new design for the general improvement of this park.

Lincoln Park.—Two lattice frames were made at the toilet entrances to the comfort station, to prevent trespassing through the hedge. A new landscape design has been developed in the section of the park west of the statue. A broad entrance mall now leads directly to the Lincoln statue on the axis of East Capitol Street, replacing the previous circuitous walk system. The former circular flower beds have given place to a large perennial flower garden which borders the mall on both sides and in turn is inclosed by a thick plantation of large flowering shrubs. In this improvement there were constructed 565 square yards of cement walk, 14 feet of cement coping, and 2 cement posts. A gravel border was laid. One hundred and forty-eight large shrubs were planted; also 221 hedge plants and 4,560 perennial plants. A photograph of the new entrance accompanies this report. The front of the lodge, the display fountains, and the drinking fountains were painted.

Marion Park.—Repairs were made to the brick sidewalk and gravel driveway.

Stanton Park.—The gravel margins of walks were repaired; 42 loads of screened gravel were used in this work. The statue of Gen. Greene was set considerably out of plumb when erected many years ago. During March the holding-down bolts were cut out, the statue plumbed, bolted down to the pedestal, and the base filled with cement grout.

Reservation 53 (Pennsylvania Avenue and G Street, between Fourteenth and Fifteenth Streets SE.).—An 8-inch cement coping 148.5 feet in length was constructed around this reservation.

Reservation 88 (Massachusetts Avenue and A Street, between Thirteenth and Fourteenth Streets SE.).—Four hundred and seven linear feet of 8-inch cement coping was constructed around this reservation.

Reservation 126 (Virginia Avenue, Potomac Avenue, and L Street, between Ninth and Eleventh Streets SE.).—The west half of this reservation was improved by the development of a new public playground. (See accompanying plan.) About 2,500 cubic yards of clay was excavated and hauled away; cement walks and steps were constructed. A cinder running track 200 feet long and 25 feet wide was constructed. The Public Playgrounds Association constructed a wading pool, comfort station, sand boxes, swings, etc. Five hundred and sixty feet of privet hedge, 38 trees, and 33 shrubs were planted. A large circle was developed in the center of the reservation, inclosed with hedge and planted with 12 small evergreen specimens. A drinking fountain with gas lamp attached was erected at the east end and 4 gas lamps were erected in the circle in the center of the reservation. Bare places in the lawns were dug up, seeded, and rolled. The two old drinking fountains were taken down.

Reservation 236 (North Carolina Avenue and B Street, between Thirteenth and Fourteenth Streets NE.).—A brick sidewalk 5 feet wide was laid at the base of this reservation, and the ground graded out to the walk and sodded.

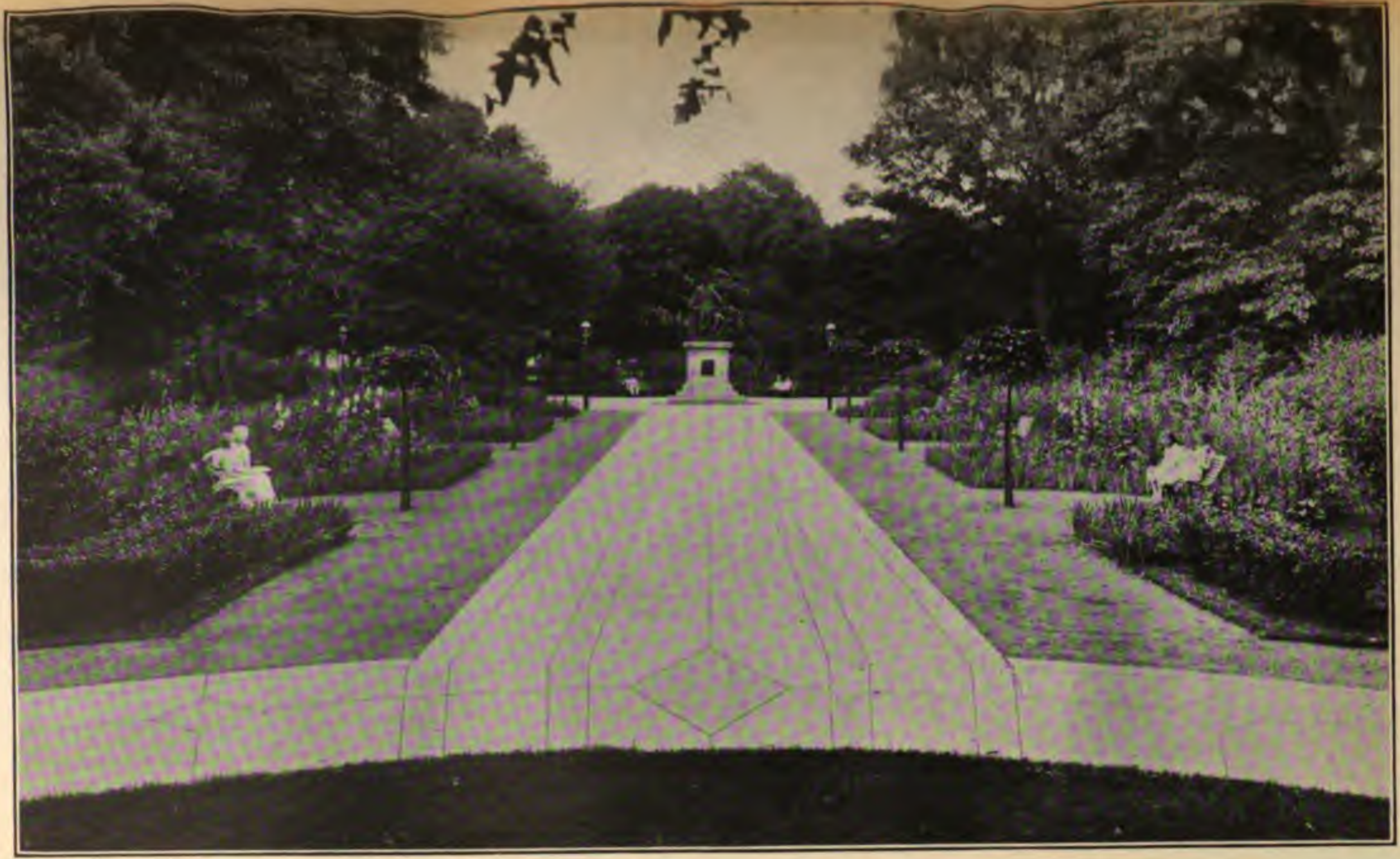
Reservations 247 and 248 (Potomac Avenue, between One-half and Second Streets SE.).—These reservations were inclosed with iron post and chain fences. Two hundred and eight posts and 1,600 feet of iron chain were used in the work.

Reservation 252 (Potomac Avenue and K Street, between Eleventh and Twelfth Streets SE.).—This reservation was brought to grade with clay hauled from reservation 126.

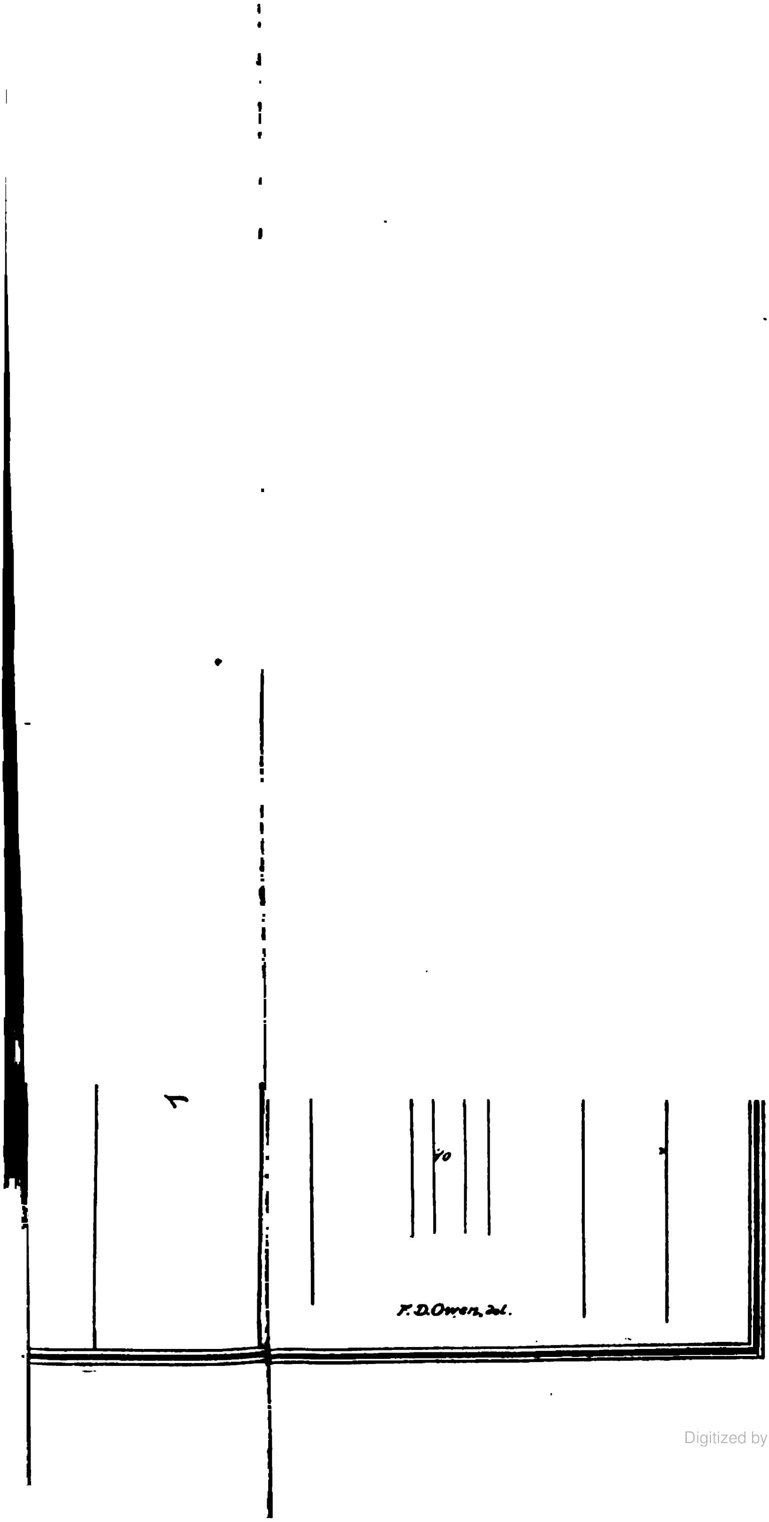
Reservation 267 (Tennessee Avenue and Thirteenth Street, between B and C Streets NE.).—The old wire fence inclosing this reservation was taken down and removed.

WATER PIPES, DRAINPIPES, AND FOUNTAINS.

Repairs were made to water pipes and valves where necessary and new valves put on. In the autumn the water was shut off from the various parks and the hose valves removed and taken to the shops at



NEW ENTRANCE, LINCOLN PARK. VIEW LOOKING EAST.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the nursery and repaired during the winter. In the spring the valves were replaced and the water turned on. During the year the following additional galvanized-iron water pipe was laid in the parks, as mentioned in detail elsewhere in this report: One thousand eight hundred and twenty-four feet of 4-inch pipe, 1,198 feet of 3-inch pipe, 3,077 feet of 2-inch pipe, 4,593 feet of 1¼-inch pipe, and 58 feet of ¾-inch pipe, a total of 10,750 feet.

Stoppages were removed from drainpipes and repairs made to broken pipes as required. The following quantity of additional drainpipe was laid during the year: One thousand and ninety-three feet of 12-inch terra-cotta pipe. Eight brick catch basins were constructed.

The fountains were given regular attention and repairs made to supply pipes, waste pipes, and valves. The display fountains and their jets were cleaned weekly except in winter, when the jets were removed and stored until spring. New dippers were placed on the drinking fountains where needed. The water was turned off during the winter. Two display fountains and two drinking fountains were painted.

LIGHTING THE PUBLIC GROUNDS.

The following parks are lighted with electric arc lights:

	Lights.
Executive Mansion grounds	5
President's Park	9
Monument Park	12
Franklin Park	9
Judiciary Park	9
Lincoln Park	8
Lafayette Park	6
Propagating Gardens	6
Potomac Park driveways	67
Total	131

Two of the lamps in the Potomac Park division were discontinued and taken down on March 1, being no longer needed, the District government having erected lamps on the streets in the vicinity.

A question having arisen in December as to whether the candle power of the arc lamps met the requirements of the contract specifications, pending its decision payments under the contract were suspended and no payments have been made since the one for the October service. In the sundry civil act approved March 4, 1911, it is provided that—

> Any settlement for arc lighting under the existing contract with the Potomac Electric Power Co. effected by the Commissioners of the District of Columbia shall apply to the contract with the same company for arc lights for the public grounds and highway bridge.

At the close of the fiscal year no settlement had been effected by the commissioners.

The number of gas lamps in the public grounds not connected with meters lighted during the year was 226 in July and August, 231 from September 1 to January 19, and 227 from January 19 to June 30. Five were taken down during the year and 6 were erected. At the request of this office the Bureau of Standards in March made a series of tests to determine the actual candle power of the incandescent gas lamps in the parks. The result of the test showed the lamps to be fulfilling the requirements of the specifications. On April 20 the contracting company executed a supplemental contract in which it was agreed that they would make a reduction to this office in the contract price for the lamps equal to any reduction they might make the District government on account of any reduction that might be made to the contractors by the gas company which supplied them with gas for the lamps. This reduction amounted to 58 cents per lamp per annum, and dated from January 1, 1911, so that this office paid during the last half of the fiscal year only $20.22 per lamp per annum instead of the $20.80 called for in the original contract.

WALKS, ROADS, CURBING, AND COPING.

Walks.—Five hundred and sixty-five square yards of cement sidewalk were constructed.

Roads.—Seven thousand five hundred and five square yards of gravel roads were resurfaced with broken stone. Twenty-nine hundred and forty square yards of macadam roads were constructed with a water-gas tar as a binder, and 3,500 square yards were constructed using a coal tar as a binder. One hundred and thirty-two thousand one hundred and ninety square yards of macadam roadway was oiled, and 34,300 square yards of macadam road was surface treated with a water-gas tar. The following table shows in detail the cost of the work.

Table showing cost of treating macadam roads with asphaltic oil or tar in Washington parks during the fiscal year.

Location of road.	Material used.	Quantity.	Area of road.	Length of road.	Square yards treated per gallon.	Cost of oil and applying per square yard.	Remarks.
		Gallons.	*Sq. yards.*	*Feet.*		*Cents.*	
White Lot	Oil	2,300	7,500	1,300	3.26	2.8	Two applications during year; 3 applications in all.
Do.	...do	4,000	19,000	3,500	4.75	2.2	Second application.
Around base of Monument.	...do	1,000	3,400	650	3.40	2.7	Do.
Monument Grounds	...do	700	8,600	2,300	12.23	1.2	Do.
Monument Grounds Annex.	...do	5,000	25,000	5,000	5.00	2.1	Do.
West Potomac Park	...do	10,600	43,560	9,000	4.11	2.2	Do.
East Potomac Park	...do	3,400	19,450	3,800	5.72	1.9	Do.
B Street, Virginia Avenue to Twenty-first Street.	...do	350	4,000	1,200	11.43	1.3	Do.
B Street, Fifteenth Street to Sixteenth Street.	...do	1,000	1,680	700	1.68	4.6	First application.
Monument Grounds	Tar	6,000	11,400	3,500	1.90	4.4	Do.
Do.	...do	650	1,500	500	2.3	3.8	Do.
B Street, Sixteenth Street to Virginia Avenue.	...do	1,600	3,560	1,600	2.23	3.8	Do.
Henry Park	...do	2,580	7,740	2,800	3.00	3.1	Do.
B Street, Twenty-first Street to Twenty-sixth Street.	...do	2,400	8,100	2,100	3.39	2.8	Do.
Smithsonian Park	...do	875	2,000	700	2.38	3.8	Do.
Total		43,455	166,490	38,650	Av. 3.83	Av. 2.5	

	Cents.
Cost of labor per square yard	0.8
Cost of oil per gallon	6.5
Cost of tar per gallon	6.8
Average cost in past years of watering roads, per square yard	3.7

There are about 4,500 feet of gravel and macadam roads 30 feet wide (15,000 square yards), which have not yet been treated with oil.

Curbing and coping.—Substantial and gratifying progress was made during the year in constructing cement copings around reservations, with corner posts of similar materials at entrances to walks. A total length of 3,983 feet of coping and 6 corner posts were built during the year, all the work having been done under contract. There was also constructed 2,736 linear feet of cement curbing, all on North B Street.

MISCELLANEOUS.

Benches.—During the year 168 park benches were repaired and 1,148 were painted. All loose benches in the parks were fastened down.

Manure.—Green manure received from Government stables and 1,300 cubic yards received from other sources without expense to the United States was piled in the compost grounds, located in an unimproved portion of Potomac Park, about 600 feet south of B Street, between Eighteenth and Nineteenth Streets. The manure when rotted made 1,000 cubic yards, which were hauled out to the various parks in December and spread over the lawns and around shrubs and young trees. In the spring this was raked in and the refuse removed. Thirty-nine tons of shredded cattle manure, 20 tons of air-slaked lime, and 5 tons of bone meal were purchased and spread over lawns not treated with stable manure.

Fences.—Repairs were made to post and chain fences as required; such fences were placed around two reservations hitherto uninclosed. The iron post and chain fences around four reservations and the iron pipe and post fences around two were taken down and removed. In all but one case the fences were replaced with cement copings.

Removing snow and ice.—The snow and ice were removed as soon as possible after each storm from the walks around and through the various parks. When, through freezing, the snow could not readily be removed sand was sprinkled and the slush and dirt removed as soon as a thaw set in. There were in all 12 falls of snow between November and March.

Park lodges.—The plumbing in the lodges was looked after and kept in good order and the toilets were regularly policed. The front of one lodge was painted.

CHILDREN'S PLAYGROUNDS.

In accordance with law, authority was granted in the summer of 1905 by the officer in charge of public buildings and grounds to the Washington Playgrounds Association for the temporary use of reservations Nos. 19 and 126, in the southeastern part of the city, as children's playgrounds. During the summer and fall of 1908 a number of complaints were received from residents in the vicinity of the two reservations that their use for playground purposes constituted a serious nuisance. Upon investigation it was found that most of the abuses complained of were due to the fact that the playgrounds had not been under proper supervision, and permission for their use was temporarily revoked. It was, however, again granted the association on June 8, 1909, under regulations which it was hoped would remove the cause of complaint. These hopes were realized, and authority was granted for the use of the two reservations and for a portion of Garfield Park for the season of 1910. Similar authority was granted on June 1 for the use of reservation 126 and a portion of Garfield Park for the season of 1911, and a request received from the association the latter part of June for the use of reservation 19 will also be granted. The playground in reservation 126 was greatly improved during the year.

PARK WATCHMEN.

During the year the parks and reservations under the office of public buildings and grounds were patrolled by 1 sergeant and 20 privates during the day and by 1 sergeant and 20 privates during the night. Nearly all the parks were policed from 8 a. m. to midnight; in addition, the grounds south of the Executive Mansion, Monument Park, Monument Park Annex, and Potomac Park were patrolled by one watchman on a bicycle from midnight to 8 a. m., and the greenhouse and nursery grounds were patrolled by another watchman on foot during the same hours. Smithsonian, Henry, and Seaton Parks were patrolled until 2 o'clock each morning.

Both sergeants and 17 of the privates do duty on bicycles; the remainder of the men are on foot. The general conduct of the men was good, and but few of them were reported for infractions of the regulations.

The watchmen enforced the police and park regulations in the parks, public travel on the park roads was regulated by them, fast driving kept down, the lawns, shrubbery, trees, and flower beds were protected from injury, women and children were protected from annoyance, known vagrants and loafers were kept out of the parks, all people under the influence of liquor were ejected, and rowdyism and disorder were prevented. The many visitors to the city who pass through the parks were courteously directed and given any desired information. In addition, extra details of park watchmen were made for band concerts, baseball games, statute unveilings, athletic events, etc.

The members of this police force are known as "park watchmen." This is a misnomer and should be changed to "park policemen." When the force was first organized and named, the men's duties were purely those of watchmen, as they took care of the parks, watered the plants, etc., and performed no police duties, these being in the hands of the Metropolitan police. Later they were by act of Congress given the same powers and duties as the Metropolitan police of this city and placed in uniform at their own expense, but no change was made in their designation. If this change is made, it is believed it will result in an increased authority in their dealings with the public. The change in designation would now be especially fitting, as Congress, in the legislative, executive, and judicial appropriation act approved March 4, 1911, provided funds for uniforming the members of the force and for the purchase of revolvers for their use.

By the act of Congress approved February 28, 1901, and amended by act of Congress approved March 1, 1905, the Commissioners of the District of Columbia are authorized and directed to deposit with the Treasurer of the United States, out of receipts from fines in the police court and receipts from dog licenses, a sufficient amount to meet any deficiency in the policemen's fund or firemen's fund. The proceeds from arrests made by park watchmen in the way of fines and forfeited collateral amount to from $1,100 to $2,000 a year. This sum is, under the above acts, added to the pension fund of the Metropolitan police and firemen. It would seem only just that the park watchmen should be included in the benefits of this fund.

The following table shows that in the parks for which watchmen are provided there were 228 arrests made during the year, and that the fines imposed and collateral forfeited in these cases amounted to $1,107; that in addition to the arrests made 1,586 drunken people and 385 persons of objectionable character were ejected from the parks.

	1910						1911						
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Total.
NATURE OF OFFENSES.													
Disorderly conduct	9	14	13	11	4	2	3	2	3	4	11	16	92
Drunkenness	4	3	4	6	3	6	2	....	2	4	5	7	46
Vagrancy	1	5	2	1	1	....	4	....	....	1	1	2	18
Disorderly assembly	....	1	....	....	....	....	....	....	....	....	....	....	1
Indecent exposure	4	3	2	6	3	1	1	....	1	....	3	2	26
Violation of park regulations	1	....	1	7	....	....	....	....	....	2	1	3	15
Violation of police regulations	....	....	....	....	....	....	1	....	....	....	....	....	1
Trespass	1	....	....	....	....	3	....	....	....	....	3	....	7
Assault	....	....	....	1	....	....	....	....	....	....	....	....	1
Indecent assault	....	....	2	....	....	....	....	....	....	....	....	....	2
Larceny	....	1	....	....	....	....	....	1	....	....	....	4	6
Throwing missles	2	3	....	....	....	1	....	....	....	....	....	....	6
Violation of auto regulations	....	....	....	....	....	....	....	....	....	1	....	....	1
Insane	....	....	....	....	....	....	....	....	....	....	1	....	1
Carrying concealed weapons	....	1	1	....	....	....	....	....	....	....	....	....	2
Colliding	....	....	....	2	....	....	....	....	....	....	....	....	2
Fugitive from home	1	....	....	....	....	....	....	....	....	....	....	....	1
Total number of arrests	23	31	25	34	11	13	11	3	6	12	25	34	228
Drunkards ejected	206	251	204	194	111	53	41	64	115	98	50	199	1,586
Objectionable characters ejected	50	72	74	63	26	8	6	4	16	20	10	36	385
DISPOSITION OF CASES.													
Fined	6	3	7	5	2	1	1	....	2	3	9	7	46
Forfeited collateral	10	12	7	8	4	5	7	1	1	3	5	10	73
Sent to workhouse	1	5	1	6	....	....	1	....	1	....	4	7	26
Drunkards released	4	3	4	6	3	6	2	2	2	4	5	7	48
Dismissed	....	3	2	1	1	....	....	....	....	1	....	2	10
Personal bonds taken	1	3	2	1	....	1	....	....	....	1	1	1	11
Placed on probation	....	1	....	5	....	....	....	....	....	....	....	....	6
Sentence suspended	....	1	....	1	....	....	....	....	....	....	....	....	2
Turned over to Metropolitan police	1	....	2	....	....	....	....	....	....	....	1	....	4
Sent to House of the Good Shepherd	....	....	....	1	1	....	....	....	....	....	....	....	2
Total cases disposed of	23	31	25	34	11	13	11	3	6	12	25	34	228
RECORD OF FINES.													
Total amount of fines	$36	$36	$35	$62	$30	$5	$10	$10	$20	$25	$65	$115	$449
Total amount of collateral forfeited	47	137	38	60	30	22	179	....	2	47	34	62	658
Total fines and collateral forfeited	83	173	73	122	60	27	189	10	22	72	99	177	1,107
MISCELLANEOUS.													
Sick or injured sent to hospital	5	4	2	4	....	2	3	....	....	2	7	3	32
Attempted suicide	....	....	1	....	....	....	....	....	....	....	1	....	2
Drowning cases	1	....	....	....	....	....	....	....	....	1	....	....	2
Suicide	....	....	....	....	....	....	....	....	....	1	1	....	2
Dead bodies found	....	....	....	1	....	....	....	....	....	....	....	....	1
Lost children returned	1	1	....	....	....	....	....	....	....	1	1	....	4
Collisions by autos in parks	1	2	1	1	1	2	....	....	....	....	....	....	8
Collisions on Highway Bridge	1	....	....	....	....	....	....	....	....	1	....	....	2

BAND CONCERTS.

The concerts in the city parks by the Engineer Band from Washington Barracks and the Fifteenth United States Cavalry Band from Fort Myer, which, with the approval of the Secretary of War, were inaugurated in 1904, were given again in the summer of 1910 and resumed in June, 1911. The concerts were scheduled, weather permitting, on Mondays, Tuesdays, Thursdays, and Fridays, between 7.30 and 9 p. m., in the following-named parks:

Du Pont Circle.—July 15, August 19, September 19, 1910, July 14, 1911.

Franklin Park.—July 19, August 15, September 2, 13, 29, 1910, June 12, 1911.

Garfield Park.—July 5, August 5, 22, September 16, 1910, June 8, 1911.

Iowa Circle.—July 26, August 12, 26, September 20, 1910, June 15, 1911.

Judiciary Park.—July 12, August 11, 18, 25, September 1, 8, 15, 27, 1910, June 9, 23, 1911.

Lincoln Park.—July 22, August 16, 29, September 22, 26, 1910, June 1. 16, 29, 1911.

Logan Park (Anacostia, D. C.).—July 1, August 2, September 9, 1910, June 30, 1911.

Smithsonian Grounds.—July 8, 29, August 23, 30, September 12, 23, 1910, June 5, 19, 1911.

Washington Circle.—August 9, September 6, 30, 1910, June 2, 1911.

To accommodate the bands a portable band stand and camp stools were provided, which were hauled to the park the day of the concert and removed the day following. Lamps were provided for the musicians.

In addition to the concerts mentioned above, the usual Wednesday afternoon concerts in the Capitol Grounds were given by the Marine Band from July 1 to September 30, 1910, and in June, 1911. That band also gave concerts in the grounds south of the White House on Saturday afternoons in July, August, and September, and on Easter Monday, April 17.. Concerts were also given at the new band stand in Potomac Park on the following afternoons:

Saturday, October 1, Cavalry Band.
Wednesday, October 5, Engineer Band.
Saturday, October 8, Cavalry Band.
Wednesday, October 12, Engineer Band.
Saturday, October 15, Cavalry Band.
Wednesday, October 19, Engineer Band.
Saturday, October 22, Cavalry Band.
Wednesday, October 26, Marine Band.
Saturday, October 29, Marine Band.
Wednesday, November 2, Marine Band.
Saturday, November 5, Marine Band.
Wednesday, November 9, Marine Band.
Saturday, November 12, Marine Band.
Saturday, April 15, Marine Band.
Wednesday, April 19, Marine Band.
Saturday, April 22, Marine Band.
Wednesday, April 26, Marine Band.
Saturday, April 29, Marine Band.
Wednesday, May 3, Marine Band.
Saturday, May 6, Marine Band.
Wednesday, May 10, Marine Band.
Saturday, May 13, Marine Band.
Wednesday, May 17, Marine Band.
Saturday, May 20, Marine Band.
Wednesday, May 24, Marine Band.
Saturday, May 27, Marine Band.
Wednesday, May 31. Marine Band.
Saturday, June 3, Marine Band.
Wednesday, June 7, Engineer Band.
Saturday, June 10, Marine Band.
Wednesday, June 14, Engineer Band.
Saturday, June 17, Marine Band.
Wednesday, June 21, Engineer Band.
Saturday, June 24, Marine Band.
Wednesday, June 28, Engineer Band.

3. POTOMAC PARK AMD MONUMENT GROUNDS

Maintenance of improved portions of West Potomac Park.—The cinders on the roads of approach to the bridge across the inlet to the tidal basin were removed and a bituminous macadam roadway constructed over an area of 1,262 square yards. Three thousand five hundred square yards of bituminous macadam roadway, with 1,800 linear feet of brick gutter and 8 catch basins, was constructed west of the band stand, connecting the section of Potomac Drive along the river with the section around the basin. The bridal paths were resurfaced with sand where required. One thousand nine hundred and thirteen linear feet of brick gutter was repaired. One hundred and ninety-nine trees that had died during the summer were replaced with new stock, and 14 new trees were planted on Potomac Drive. Two hundred and ninety trees were planted in other portions of the park. A row of iron posts was placed along the northern boundary of the park between Twenty-first and Twenty-third Streets and between Twenty-fifth and Twenty-sixth Streets NW. The iron-pipe railing around the northern portion of the tidal basin was painted. The roof of the band stand was given one coat of paint.

Improvement of interior portion of West Potomac Park.— This is the unimproved portion of the park between the tidal basin and B Street north, for which the sum of $25,000 was appropriated. With this amount the following work was accomplished:

Graded and covered with soil	square yards..	70,000
Material handled	cubic yards..	22,300
12-inch terra-cotta pipe laid	linear feet..	1,093
4-inch cast-iron water pipe laid	do....	1,824
3-inch cast-iron water pipe laid	do....	1,198
2-inch galvanized-iron water pipe laid	do....	2,287
1½-inch galvanized-iron water pipe laid	do....	3,290
Trees planted		1,530
Dead trees taken out		210

Park roadway along B Street north from Virginia Avenue to Fifteenth Street west.—As stated in the last annual report, this roadway was then completed as far as Sixteenth Street. The portion between Sixteenth and Fifteenth Streets was completed during the past fiscal year. The following work was done:

Bituminous macadam road constructed	square yards..	1,678
Cement curbing constructed	feet..	2,736
Vitrified brick gutter laid	square yards..	236
Stone flagging pavement taken up and relaid	do....	533

The center parking along B Street north was planted with two carloads of rhododendrons east of Seventeenth Street, and with two carloads of mountain laurel west of Seventeenth Street.

Monument Grounds.—The work of filling up the old fish ponds south of the bathing pools was continued. During the year 20,443 cubic yards of material were received without cost to the United States and used in this work, which had been almost completed at the close of the year. The total quantity of materials received since this grading was commenced is 110,177 cubic yards. There was also received without expense to the United States 5,118 cubic yards of clay, which was used for filling low ground on the south side of B Street north between Sixteenth and Seventeenth Streets west. Three new baseball grounds were laid out and put in use, making 12 diamonds in all in use during the year. Two trap basins were repaired with new grating tops. Twenty-five square yards of stone gutter along roadways were taken up and relaid. Low places in roadway were repaired. The walls and ceiling of the lodge house were pointed up and painted.

4. WASHINGTON NATIONAL MONUMENT.

The usual care was taken to protect the shaft and keep it clean. The stairways, landings, railings, waiting rooms, marble walls on top floor and on landings, and the tablets in the interior walls were swept or otherwise cleaned. All machinery connected with the elevator was inspected, oiled, and cleaned each day before starting to carry passengers, and twice each week the safety appliances on the elevator car were tested, all by the employees at the Monument. In addition to this, the elevator and all machinery connected with it were inspected once each month by an agent of the casualty company, with whom an agreement is in force for that service. The rooms in the power house and in the lodge house were regularly cleaned and kept in good order.

The old wooden floor in the waiting room at the lodge house was taken up and a new terrazzo floor with cement subfloor laid in its place. A marble wainscoting was also constructed in the room. All of this work was done under contract. In this connection necessary changes were made in the heating pipes. The plumbing in the men's and women's toilet rooms was remodeled, new piping being installed. The men's toilet room was increased to double its former size. Two new closet bowls were placed in each toilet room in place of the old one in each, and a new urinal was placed in the men's room. New cement floors were laid in each room. All the old paint was cleaned from the doors and window frames in the waiting room, and the woodwork was then stained a light cherry and varnished. Upon the completion of these improvements the lodge was reopened to the public on September 27.

The power plant was shut down from February 20 to 25, inclusive, in order thoroughly to overhaul and repair the machinery. The woodwork at the boiler house, both inside and out, was given two coats of paint.

The old asphalt roof was removed from the coal vault at the boiler house and a new cement roof put on in its place. The flag walk east of the boiler house was replaced by a cement walk. The walls of the areaway around, and the stairway leading down to, the motor room were thoroughly cleaned, and plastered with cement mortar. A concrete ash and rubbish box was constructed at the lodge house.

The following table shows the number of visitors to the top of the Monument each month and the total during the year:

Months.	Number by the electric elevator.	Number by the stairway.	Total.
1910.			
July	11,436	925	12,361
August	19,479	2,878	22,357
September	16,223	1,397	17,620
October	13,503	1,178	14,681
November	8,535	810	9,345
December	8,156	1,046	9,202
1911.			
January	7,802	968	8,770
February	5,792	1,643	7,435
March	10,085	1,595	11,680
April	14,648	4,248	18,896
May	12,435	1,501	13,936
June	12,796	1,670	14,466
Total	140,890	19,859	160,749

Months.	Number by the electric elevator.	Number by the stairway.	Total.
Total, 1909	136,019	33,791	169,810
Total, 1910	147,300	19,226	166,526
Yearly average, 1888-1898	103,901	50,958	155,859
Yearly average, 1898-1908	111,074	41,290	152,364

The Monument was opened to the public October 9, 1888. From that date to June 30, 1911, the total number of persons who ascended to the top was 3,569,425. The Monument is opened to the public every day, except Sundays and legal holidays, from 9 a. m. to 4 p. m. It was closed once from February 1 to May 31, 1901, to permit of the installation of a new electric power plant.

Data relative to Washington Monument.

Height of cap above mean low water	596 feet 4¼ inches.
Height above doorsill	555 feet 5⅛ inches.
Side of base:	
Outside	55 feet 1½ inches.
Inside	25 feet.
Depth of foundation below doorsill (sand and clay)	38 feet.
Side of foundation	126 feet 6 inches.
Area of foundation	16,002.25 square feet.
Side of top:	
Outside	34 feet 6 inches.
Inside	31 feet 6 inches.
Walls, thickness:	
Base	15 feet ¼ inch.
Top	18 inches.
Weight of capstone	3,300 pounds.
Weight of whole Monument	81,120 tons.
Mean pressure at base	5 tons per square foot.
Pressure on foundation nowhere greater per square foot than	9 tons.
Near edges, less than	3 tons.
Taper of Monument	¼ inch to 1 foot.
Memorial stones (beginning at 30 feet, stopping at 280 feet)	179
Steps	898
Landings	50
Windows (at top only)	8
Cost	$1,300,000
Corner stone laid July 4, 1848.	
Capstone set Dec. 6, 1884.	
Dedicated Feb. 21, 1885.	
Elevator (electric) time of travel	5 minutes.
Elevator, maximum load	35 persons.
Weight of car empty	5,670 pounds.
Weight of counterweight	8,040 pounds.
Speed of elevator, 100 feet per minute.	
Engine governor throws off current at 105 feet speed per minute.	
Car safety stops car at 150 feet speed per minute.	
Elevator tested at 6 tons.	

5. PROPAGATING GARDENS, INCLUDING GREENHOUSES AND NURSERY.

The various greenhouse structures were maintained in as good condition as the small appropriation would permit, and the plants were given necessary care and attention.

All decayed woodwork in the houses was replaced and the repaired work painted. Broken glass was replaced. The flues of boilers were cleaned and put in good order, and heating pipes, water pipes, and boilers repaired. The water service in one house was extended.

The work of reconstructing one of the houses, which was commenced in May, 1910, was completed in October. The exterior walls of the large brick potting shed were scraped and painted.

In the nursery grounds the lawns, roads, walks, and drains were cared for and the stock cultivated.

This office is frequently in receipt of requests for the loan or gift of plants from the gardens for the use of churches, fairs, festivals, etc., and for private purposes. All such requests have to be declined, as either the loan or gift of any plants would be in violation of the following extract from the act of Congress approved June 30, 1878:

> *Provided*, That hereafter only such trees, shrubs, and plants shall be propagated at the greenhouses and nursery as are suitable for planting in the public reservations, to which purposes only the said productions of the greenhouses and nursery shall be applied.

The total number of plants propagated at the gardens was 677,290. Of these 634,099 were used for the reservations, the greenhouses, and the nursery under the charge of this office, and about 10,640 for other departments of the Government. The surplus remaining (about 39,361) were distributed to Government and municipal offices, hospitals, public institutions, etc. The following list shows the stock grown, purchased, and distributed during the year:

Plants propagated and used for—	Number.	Kinds.	Varieties.
Park plantings	563,800	25	55
Stock, greenhouses, nursery, and fall plantings	67,370	22	270
Colonial Gardens, White House	2,929	10	14
Grounds of Treasury Department	730	6	6
Grounds of State, War, and Navy Department	6,600	9	16
Grounds of United States Capitol	15,300	16	32
Grounds of Interior Department	500	3	4
Grounds of Bureau of Engraving and Printing	2,110	14	17
Grounds of Census Bureau	700	(1)	(1)
Grounds of Washington Aqueduct	925	(1)	(1)
United States navy yard	600	(1)	(1)
Bureau of American Republics	900	(1)	(1)
No. 4 Truck Company, District of Columbia fire department	762	(1)	(1)
No. 6 Truck Company, District of Columbia fire department	950	(1)	(1)
No. 2 Engine Company, District of Columbia fire department	500	(1)	(1)
No. 8 Engine Company, District of Columbia fire department	1,000	(1)	(1)
No. 12 Engine Company, District of Columbia fire department	800	(1)	(1)
No. 13 Engine Company, District of Columbia fire department	240	(1)	(1)
No. 16 Engine Company, District of Columbia fire department	108	(1)	(1)
No. 18 Engine Company, District of Columbia fire department	700	(1)	(1)
No. 19 Engine Company, District of Columbia fire department	724	(1)	(1)
No. 21 Engine Company, District of Columbia fire department	700	(1)	(1)
HOSPITALS AND INSTITUTIONS.			
Casualty Hospital	500	(1)	(1)
Children's Hospital	500	(1)	(1)
Columbia Hospital	360	(1)	(1)
Corcoran Art Gallery	900	(1)	(1)
Emergency Hospital	500	(1)	(1)
Flower and Fruit Guild	1,182	(1)	(1)
Freedmen's Hospital	400	(1)	(1)
Garfield Memorial Hospital	200	(1)	(1)
Georgetown University Hospital	500	(1)	(1)
Home for the Aged and Infirm	1,000	(1)	(1)
Homeopathic National Hospital	400	(1)	(1)
Industrial Home School for Colored Children	700	(1)	(1)
Louise Home	200	(1)	(1)
Providence Hospital	500	(1)	(1)
Sibley Memorial Hospital	500	(1)	(1)
Total	677,290		
PLANTS PURCHASED.			
Hardy flowering bulbs	33,500	5	14
Tender flowering bulbs	14,000	3	3

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(1) General stock.

The following data give a general idea of the work done during the year at the propagating gardens:

GROWN IN GREENHOUSES FOR SPRING, AUTUMN, AND WINTER BLOOM AND FOR DECORATIVE PURPOSES.

Chrysanthemums	5,000
Carnations	7,400
Roses	4,208
Poinsettias	500
Stevias	1,000
Violets	2,052
Tropical and decorative plants	5,900

PLANTED AT PROPAGATING GARDENS.

Antirrhinums	2,000
Asters	1,460
Cannas	200
Cosmos	1,000
Canterbury Bells	250
Dahlias	400
Daisies	1,500
Gladioli	2,000
Heliotrope	500
Roses	1,500
Sweet Williams	500
Wall flowers	1,000

POTTED AND BOXED FOR WINTER FORCING.

Roman hyacinths	8,000
Narcissus	3,000
Lily of the Valley	3,000

PLANTED IN VARIOUS RESERVATIONS, INCLUDING WEST POTOMAC PARK.

Bulbs for spring bloom	33,500
Pansies for spring bloom	28,000
Bedding plants for summer decoration	563,800
Tropical plants for summer decoration	5,900
Vases stocked for summer decoration	18

Storehouses and shops, propagating gardens.—The tools, supplies, and other Government property in the storehouse and shops were cared for. The gutters and down spouts on both buildings were repaired.

Repairs were made to lawn mowers, wheelbarrows, and miscellaneous tools, edge tools sharpened and kept in good order, and new tools purchased from time to time as required.

A sale of old, unserviceable, and condemned materials, and tools was held on April 10, 1911, and the gross proceeds thereof, amounting to $169.89, deposited in the Treasury of the United States. Of this amount $1.63 was for property belonging to the Highway Bridge.

6. HOUSE NO. 516 TENTH STREET NW., WHERE ABRAHAM LINCOLN DIED.

This property was purchased by the United States in November, 1896, since which date it has been under the supervision of this office.

By authority of the Secretary of War, dated October 9, 1899, Mr. O. H. Oldroyd is allowed to occupy this building with his family as custodian, without pay, and to exhibit his Lincoln Museum, for which he charges a small entrance fee.

During the year repairs were made to the plumbing fixtures and electric bells from time to time as required.

The walls and ceiling of the hallway from the first to the third floors, of the bathroom, and of the dining room, were scraped and papered. The front, back, and roof of the house were painted.

The old iron covering was removed from the roof of the rear porch, the sheathing repaired, and a new tin covering put on. One partition was rebuilt and the dividing fence on south side of the yard was thoroughly repaired with new material.

7. BUILDINGS OCCUPIED AS OFFICES BY THE WAR DEPARTMENT. EXCEPT STATE, WAR, AND NAVY DEPARTMENT BUILDING.

By order of the War Department, dated June 30, 1893, all buildings occupied as offices by the War Department, except the State, War, and Navy Department Building, were placed under the charge of this office, so far as their preservation, care, and safety are concerned. During the year the buildings thus occupied were 12 in number, as follows:

Army Medical Museum and Library, Seventh and B Streets SW.
Ford's Theater Building, 509–511 Tenth Street NW., Adjutant General's Office.
No. 610 Seventeenth Street NW., Adjutant General's Office.
No. 532 Seventeenth Street NW., office depot quartermaster.
No. 1725 F Street NW., branch printing office, War Department.
No. 1712 G Street NW., publication branch, Adjutant General's Office.
No. 1744 G Street NW., Division of Militia Affairs.
No. 1720 H Street NW., Medical Dispensary.
Annex to Winder Building, Ordnance Department.
War Department stables, G Street, between Seventeenth and Eighteenth Streets NW.
Lemon Building, No. 1729 New York Avenue NW., occupied by Supply Division, War Department, Office Public Buildings and Grounds, Signal Office, Post Paymaster, Drafting Division of the Quartermaster General's Office, etc.
No. 1800 F Street NW., occupied as an annex to the Insular Bureau of the War Department.

Monthly inspections were made of these buildings during the year, and they are believed to be in good and safe condition for the purposes for which they are being used. Special inspections were also made of several of the buildings at the request of the department, and special reports with recommendations made in regard thereto.

DRIVEWAY AT THE WAR DEPARTMENT BRANCH PRINTING OFFICE.

Congress, in sundry civil act approved June 25, 1910, appropriated $1,075 for constructing a driveway at this building, removing the earth embankment, and paving the area. The execution of this work was placed in charge of this office by departmental indorsement dated July 20, 1910.

It was decided to remove a portion of the earth terrace on the east of the building, to construct a paved courtyard in its place, from which wagons could deliver goods directly to the door, and to build a paved driveway leading to the courtyard from the street. The removal of the earth terrace was done by hired labor, work being commenced on August 22. A brick retaining wall with stone coping for the two sides of the terrace facing the courtyard was then built and the adjoining stable of the War Department was underpinned with brick; the area and driveway were graded and a concrete pavement laid; all this work being done under contract. The earth terrace near the retaining wall was graded to meet the new conditions. In October portions of the old front retaining wall were taken down and the bricks relaid in fresh mortar. This completed the improvement.

9. DEPARTMENTAL TELEGRAPH LINE.

This is now, except for three short overhead connections, an underground line, with about 18,950 feet of cable which is run in conduits owned by the Western Union Telegraph Co., the use of which is given the United States by law. The line starts from the Lemon Building, 1729 New York Avenue NW., where the main storage operating battery is located, and runs overhead to the corner of Seventeenth and G Streets NW., thence underground into the State, War, and Navy Department Building, thence underground to the White House and Treasury Department, thence underground to Fourteenth and G Streets NW., down Fourteenth Street to cable pole at southwest corner Fourteenth and B Streets SW., and thence from cable pole along B Street on Western Union overhead pole line to Department of Agriculture; returning from Department of Agriculture by overhead loop to cable pole at southwest corner of Fourteenth and B Streets SW., and thence in underground cable loop to Pennsylvania Avenue and E Street NW. From this point the line extends by underground cable along E Street, east to alley located between Thirteenth and Fourteenth Streets into Department of Commerce and Labor, returning by loop in same cable to E Street, thence along E Street to Eleventh Street, down Eleventh Street to the Post Office Department Building, returning in same cable by loop over same route to E Street, thence by underground cable along E Street, east to Seventh Street NW., thence along Seventh Street into the Department of the Interior, returning by loop over same route to Seventh and E Streets NW., and thence by underground cable along E Street to North Capitol Street, thence along North Capitol Street to Government Printing Office, returning in same cable by loop over same route to E Street, thence by underground cable along North Capitol Street to United States Capitol Building. From the Treasury Department there is an underground connection by cable up Fifteentn Street to a pole in the alley between H and I Streets, and from thence by aerial cable to the Department of Justice on K Street near Fifteenth Street. There are 14 local offices on the line, each having two circuits and two sets of instruments. Each office has a local battery, except the Interior Department, which has box instruments. The main battery in the Lemon Building consists of two sets of storage batteries of 50 cells each.

During the year the main battery and local batteries received necessary attention and were maintained in good working order. All grounds, crosses, and open circuits were removed as soon as possible.

At the request of the Interior Department the telegraph office was moved from the G Street side of that building to the Seventh Street side.

All cables and cable boxes in the basement of the Treasury Department were moved to a new location. This was rendered necessary by the changes made in the construction of the basement rooms.

At the request of the Department of Commerce and Labor the telegraph office in that building was moved. In November the telegraph offices in the Senate and House ends of the Capitol were connected up and made ready for the reassembling of Congress.

In April a six-conductor aerial cable was put up between the Lemon Building and the Winder Building to take the place of six separate wires that had to be removed on account of the construction of a tall building on the site over which the wires were strung.

10. HIGHWAY BRIDGE ACROSS THE POTOMAC RIVER, D. C.

On September 12, 1908, the engineer officer in charge of the improvement of the Potomac River transferred to this office, by authority of the War Department, the highway bridge across the Potomac River, including the approaches on the Washington and Virginia shores, and the bridge over the Washington Channel in the Washington approach.

During the fiscal year the draw was opened 4,441 times for the passage of vessels, or an average of approximately 12.1 openings per day. The average cost of current was 7.7 cents per opening.

Current for operating the draw and lighting the bridge and the Washington approach was furnished by contract. Thirty-seven arc lights were maintained on the bridge during the year and 11 on the approach.

The Washington Channel bridge was lighted under contract by incandescent gaslights of 60 candlepower.

The average daily travel over the bridge for seven consecutive days during June, 1911, was as follows:

Single cars, 96.1; trains of two cars each, 146.1; automobiles, 155.4; double teams, 738.3; single teams, 271.7; pedestrians, 398.4; equestrians, 26.3.

The following parts of the bridge were painted: The ironwork under the draw, including the drum and the handrail around it; all of the floor plates between the driveway and the footpath; the main floor girders on both sides; 26 crosstie grooves; and the chords of 14 spans. Repairs were made to the asphalt roadway of the bridge, the area resurfaced being 120 square yards. The granitoid pavement on the approaches to the bridge was repaired in March and April, the area repaired being 1,315 square yards. The work was done by the contractors who laid the pavement under the guaranty clause in their contract. A new submarine cable was installed to operate the motor which opens and closes the gates at the Virginia end of the bridge. The baseboard in the draw house was repaired and the walls and ceiling were painted.

11. TREES, SHRUBS, PLANTS, FERTILIZERS, AND SKILLED LABOR FOR THE GROUNDS OF THE LIBRARY OF CONGRESS, THE CAPITOL, AND EXECUTIVE DEPARTMENTS.

Grounds of the Library of Congress.—During the months of October and November the four triangular evergreen beds at the east and west entrances and the two triangular beds on the north and south fronts were entirely remodeled and replanted with evergreens and deciduous shrubs. Of the old deciduous shrubs that were removed 'n the north and south beds, 58 were found suitable for replanting in other parts of the grounds, chiefly on the north, south, and east fronts. Of the old evergreens removed from the four triangular beds, 150 were used to replace others that had died in the four circular beds at the four corner entrances to the grounds. In the remodeling of the triangular beds 100 square yards of sod were laid and 592 evergreens and 308 deciduous shrubs were planted, 75 loads of soil were hauled from Potomac Park flats, and 54 loads of clay and 11 loads of refuse were hauled to the dump. The trees and shrubs were all pruned and the grounds left in good condition. During March the lawn surfaces were fertilized with 1 ton of bone meal and 5 tons of shredded cattle manure; on the south fronts and other portions of the grounds where the summer grass was removed 480 pounds of grass and 170 pounds of rye seed were sown.

Grounds of the Capitol.—During the summer and fall the 58 flower beds and 18 vases on the Capitol terraces, around the Maltby Building, and in the laboratory grounds were fertilized with cattle manure and maintained in good condition. In October the summer flowering plants were removed from the beds to their winter quarters at the propagating gardens. The beds were then spaded and replanted with 8,000 bulbs and 1,250 dwarf evergreens. Of these, the bulbs and 945 evergreens were purchased in October; the remaining 305 evergreens were taken from stock in the nursery which had been bought in previous years. There were also planted in the grounds 100 vines bought for this purpose, and 150 deciduous shrubs taken from stock in the nursery previously purchased. In the latter part of April such evergreens as were not winterkilled were removed from the vases and beds and transplanted in the nursery at the propagating gardens for future use. The beds were dug, vases refilled with fresh compost, and planted with 15,300 tropical and summer flowering plants; six dozen water plants were planted in the two fountain basins and 50 Rhododendron maximum were planted in the courtyard of the House of Representatives Office Building. During April 75 evergreens that had been winterkilled in the beds at the west entrance to the grounds were replaced from stock in the nursery previously purchased.

Grounds of executive departments.—About 10,640 plants were furnished from the propagating gardens for improving the grounds of executive departments. These plants if purchased from commercial nurseries would have cost approximately $1,118.

12. UNITED STATES WHARF PROPERTY, WASHINGTON, D. C.

By act of Congress approved March 3, 1899, the following-described property is placed under the immediate jurisdiction and control of the Chief of Engineers:

> The banks of the Potomac River from the north line of the Arsenal Grounds to the southern curb line of N Street south. * * *

By letter of March 11, 1899, from the office of the Chief of Engineers, this office was directed, as representative of the Chief of Engineers, to assume control of this wharf line, which since that date has been in charge of this office. No work on the wharves has been done by this office during the year, as there are no funds available for either the improvement or care of the property.

Most of this wharf property is now leased to private parties by the Chief of Engineers under authority contained in the act quoted. During the past year the conditions under which the property is occupied and the rentals paid therefor were carefully looked into by this office, with the result that in all cases but one new leases have been executed at largely increased rates. The question of the proper rental to be paid in the one excepted case is now under consideration, and when decided a new lease will be executed.

The following-described leases, made by the Chief of Engineers, are now in force:

June 16, 1903, with Thomas R. Riley, for wharf and building thereon at foot of Sixth Street, opposite lot 13, square 503. Consideration, $50 per month, payable in advance.

February 26, 1903, with Brig. Gen. George H. Harries, commanding the District of Columbia National Guard, to erect and maintain a wharf opposite the foot of O Street SW. for the use of the Naval Reserve of the District of Columbia Militia.

February 11, 1909, with the Secretary of Commerce and Labor, to use and control an area at the intersection of O Street and Water Street SW., and to build and maintain thereon a wharf for the use of the United States Lighthouse Establishment.

May 26, 1911, with the Corinthian Yacht Club, to use a land and water area opposite lots 16, 17, and 18, square 503, with right to erect a boathouse thereon and to build wooden walk ways around three sides of the water area for fastening boats and gaining access to them. Consideration, $272 per annum, payable quarterly in advance.

June 10, 1911, with Thomas Banks, for dock, wharf, building, and grounds, foot of Sixth Street, opposite lot 14 in square 503. Consideration, $25 per month, payable in advance.

June 17, 1911, with George W. Webber, for dock, building, and ground, foot of Sixth Street, opposite lot 14, square 503, with the right to carry on the business of boiler making and repairing and blacksmithing. Consideration, $15 per month, payable in advance.

June 17, 1911, with John E. Reyburn, for dock, wharf, building, and ground, foot of Sixth Street, opposite lot 14, square 503, for storage and dockage purposes. Consideration, $100 per annum, payable quarterly in advance.

July 19, 1911, with Edward Whyte, for land and water area opposite lots 9 and 10, square 504, near the foot of P Street SW., with the right to maintain a building thereon and to use the same for building, repairing, hiring, and storing boats. Consideration, $7 per month, payable in advance.

On January 15, 1910, the Secretary of War granted the Navy Department permission for the temporary use of a wharf and land adjacent thereto near the foot of Twenty-sixth and B Streets NW., in Potomac Park, for the United States Naval Medical School Hospital.

On January 9, 1911, the Chief of Engineers executed a lease with N. B. Plunkett for the use by the latter of the boathouse owned by the United States at the foot of Seventeenth Street NW., on the shore at the northeast corner of the tidal basin, with the right to rent boats, sell bait, refreshments, etc. Consideration, $180 per annum, payable quarterly in advance.

13. MONUMENT AND WHARF AT WAKEFIELD, VA., THE BIRTHPLACE OF WASHINGTON.

The United States watchman in charge extended the usual care to this property and during the growing season kept the grass cut around the monument. In August 72 feet of 12-inch terra-cotta pipe was laid in the Government road leading from the United States wharf to the monument to drain the farm lands on both sides. In June the brush along the roadway was grubbed out and the fence repaired.

STATUES.

There are now 32 statues in the public grounds under the charge of this office, 1 in course of construction (that of Gen. Ulysses S. Grant), and 3 in contemplation—those of Barry, Columbus, and John Paul Jones.

The following statue was completed during the fiscal year, as described in detail in a subsequent part of this report:

Statue of Gen. Baron von Steuben; erected at the northwest corner of Lafayette Park; cost, $50,000; sculptor, Albert Jaegers; unveiled December 7, 1910.

Attention has been given to all the completed statues during the year, and the pedestals and bronze figures have been maintained in a cleanly condition as far as possible.

The status of the statues completed during the year, now under contract, or in contemplation, and the work accomplished during the year are as follows:

14. MEMORIAL TO GEN. ULYSSES S. GRANT.

The act of Congress approved February 23, 1901, created a commission composed of the president of the Society of the Army of the Tennessee, the chairman of the Joint Committee on the Library, and the Secretary of War, to select a site and secure plans and designs for a statue or memorial of Gen. Ulysses S. Grant, not to exceed in cost the sum of $250,000. The act appropriated $10,000 to defray the expense of securing plans, specifications, and models. The sundry civil act approved June 28, 1902, appropriated $50,000 for commencing the erection of the memorial, and the sums of $40,000, $25,000, $42,000, and $35,000, respectively, were appropriated by the acts approved June 30, 1906, February 9, 1909, March 3, 1909, and June 25, 1910, for continuing the work.

On April 10, 1901, the commission issued an invitation for the submission of models, and in March, 1902, 27 models were submitted by 23 sculptors. Two of these models were selected for further competition. The final result was the selection of the design submitted by Henry Merwin Shrady, sculptor, and Edward Pearce Casey, architect, and a contract was entered into with them on August 10, 1903, for the production and erection of the memorial for the total sum of $240,000, the work to be completed within five years from date of contract.

The commission selected the unoccupied portion of the Botanic Garden grounds, between First and Second Streets, as the site of the memorial, and their selection was approved by Congress in sundry civil act approved June 30, 1906.

On July 24, 1907, a supplemental contract was entered into making changes in the design of the memorial to fit it better to the site selected.

On October 7, 1907, the contractors began the work of excavating for the foundation. This was stopped two days later by an order from the supreme court of the District of Columbia directing the officer in charge of public buildings and grounds to show cause why he should not be enjoined from permitting trees in the Botanic Garden grounds being cut down for the purpose of erecting the memorial. In compliance with an order of the commission, the contractors were notified on October 19 that further work would not be permitted until further notice.

In April, 1908, by order of the commission, three historic trees on the site were moved to another location in the grounds, and on May 18, 1908, the work of constructing the foundation was resumed and completed in July.

On July 29, 1908, the commission extended the date for completing the memorial for three years from August 10, 1908.

Work was commenced in August, 1908, on the construction of the marble superstructure, and completed by January 7, 1909. In the same month the four bronze lions designed for the memorial were erected. In March the ground around the memorial was cleared and rough graded. In April and June the 8 bronze lamp-posts were set in position.

The work remaining to be done for completing the memorial is as follows: Erecting upon the center pedestal the statue of Gen. Grant and placing the two bas-reliefs on that pedestal, and erecting the bronze artillery group and the bronze cavalry group on the end pedestals. The quarter-size model of the bas-reliefs and all models of the artillery group have been approved by the commission.

On October 28, 1910, payment was made to the contractors for the full-size models of the artillery group, which were then sent to the foundry to be cast in bronze.

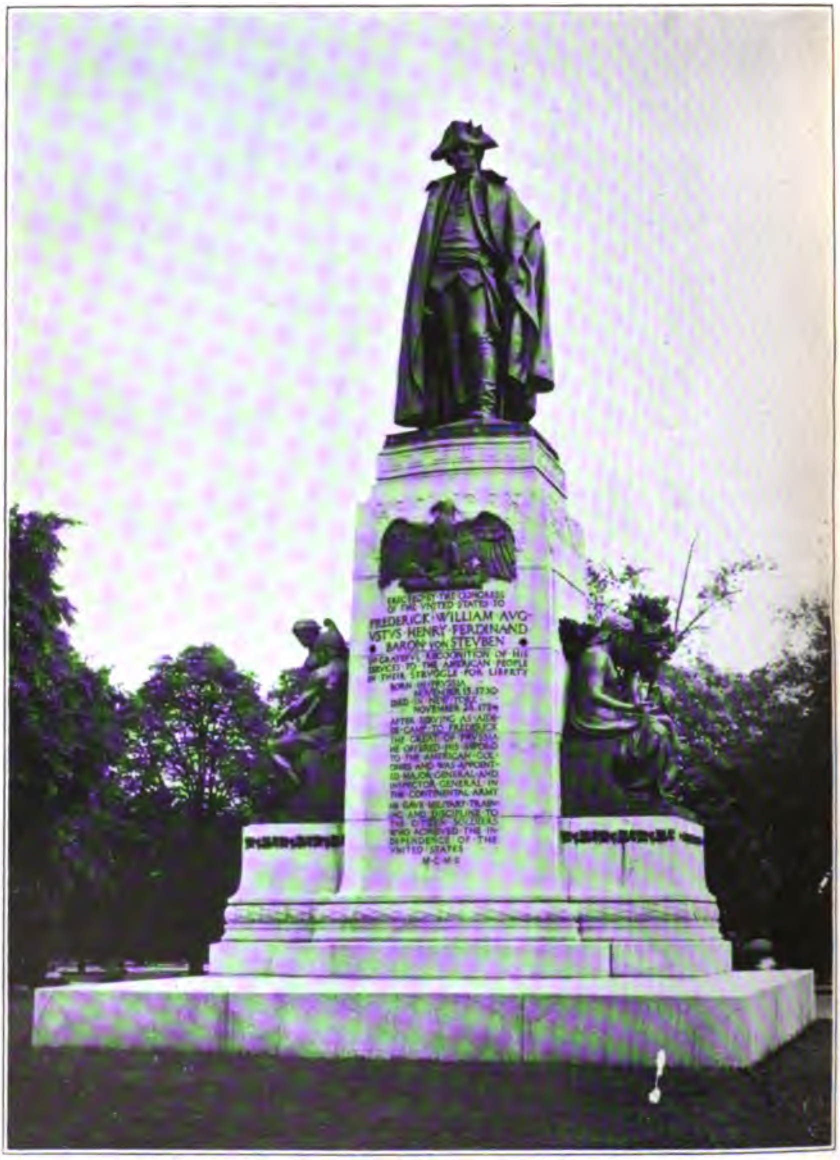
On June 19 the Memorial Commission granted the contractors an extension of time of two years, to August 10, 1913, for the completion of the memorial.

The amount expended on the memorial to June 30, 1911, was $118,425.16.

15. STATUE OF GEN. VON STEUBEN.

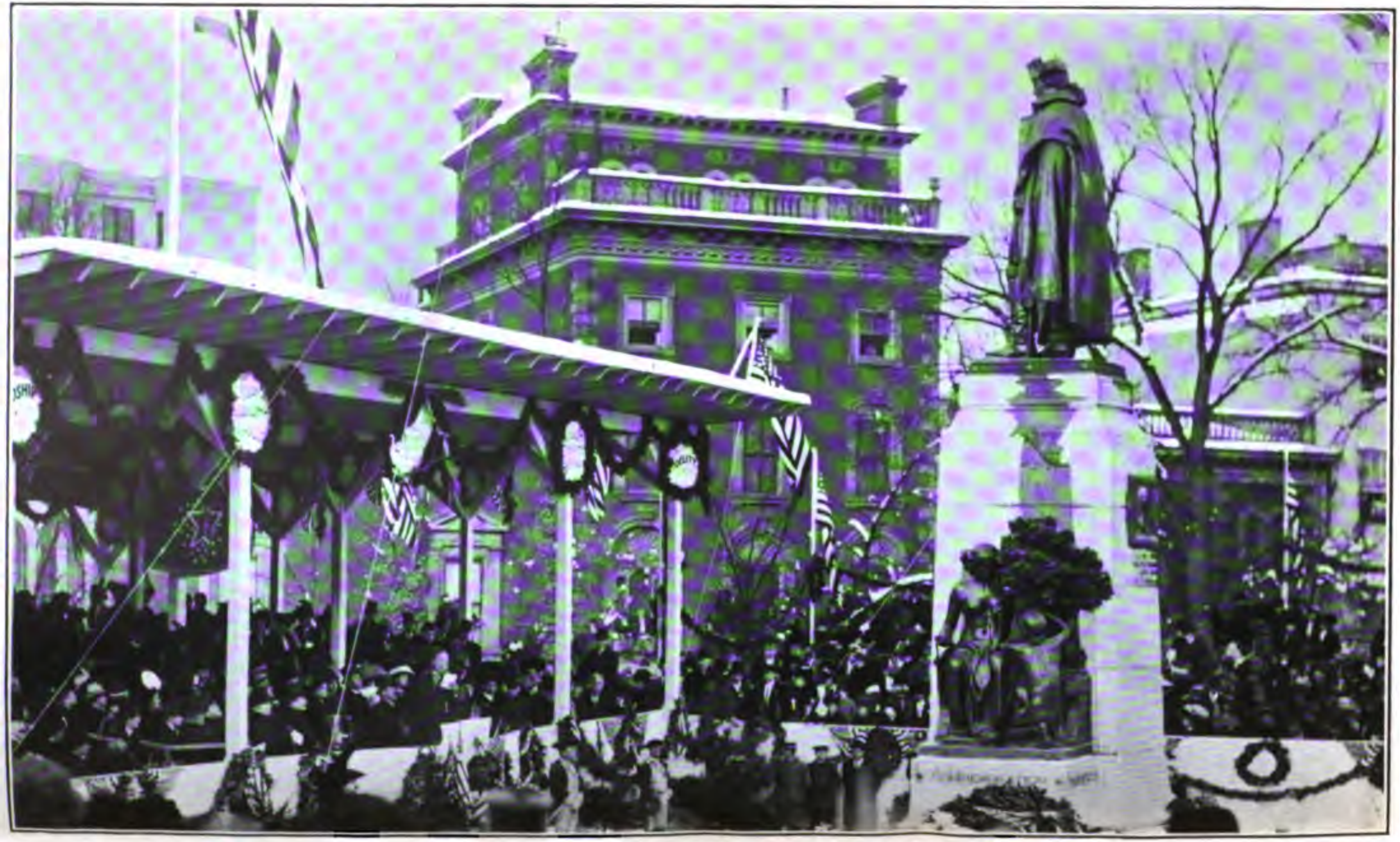
The act of Congress approved February 27, 1903, appropriated the sum of $50,000 for procuring and erecting a statue of Gen. von Steuben, and for the preparation of a site, to be expended under the direction of a commission to be composed of the Secretary of War, the chairman of the Committee on the Library of the Senate, and the chairman of the Committee on the Library of the House of Representatives of the Fifty-seventh Congress.

In July, 1905, competition was invited for the statue, and six artists submitted models in October, one of the competitors submitting two models. In December, 1905, the commission selected three of the models as the most satisfactory and requested the three artists to submit larger models of their figures for final selection. Only two of the artists entered the second competition, from which a final selection was made in May, 1906, and on January 10, 1907, a contract



THE VON STEUBEN MONUMENT, NORTHWEST CORNER LAFAYETTE PARK. VIEW LOOKING SOUTHEAST.

2991-1



UNVEILING THE VON STEUBEN MONUMENT DECEMBER 7, 1910. PRESIDENT TAFT SPEAKING.

was entered into by the commission with Mr. Albert Jaegers, the successful artist, for furnishing and erecting the monument at the northwest corner of Lafayette Park.

The working model of the statue was completed in May, 1907, and approved by the commission. In June, 1908, the model of one of the two bronze side groups was approved, and in December of the same year that of the second side group was approved. The full-size model of the statue was approved September 1, 1909, and the bronze casting of it was received in Washington on April 30, 1910, and stored at the storehouse of public buildings and grounds for safe-keeping until the pedestal was ready to receive it. In June, 1910, the full-size model of one of the two bronze side groups was approved, and on September 19, 1910, the full-size model of the second side group was approved by the commission.

The foundation for the pedestal was constructed in September, and on October 24 the setting of the granite of the pedestal was commenced. This work was completed in November, and the bronze statue and side groups were put in place during that month. The mound around the base of the pedestal was inclosed with a granite coping, and new walks around the statue were constructed and paved with asphalt.

All other necessary preparations for the unveiling ceremonies, such as issuing invitations, preparing the program, erecting and decorating stands, etc., were carried out by this office, and the statue was unveiled on December 7. The speakers at the dedication were the President, the German ambassador, the Hon. Richard Bartholdt, and Dr. Charles J. Hexamer. The work of taking down the stands was commenced on December 8 and completed on December 17. The grading and sodding of the grounds around the statue was finished in March, unfavorable weather having prevented earlier completion. Some finishing work was done in May, which practically completed the surroundings of the monument.

The amount expended to June 30, 1911, on account of the construction of this statue was $49,640.39. The cost of unveiling and dedicating the statue was $2,500, which amount was appropriated in the sundry civil act approved June 25, 1910. A photograph of the monument and one of the unveiling ceremonies accompany this report.

16. STATUE OF COMMODORE JOHN BARRY.

Congress by act approved June 8, 1906, appropriated the sum of $50,000 for a statue to the memory of Commodore Barry, to be erected on ground belonging to the United States in this city. By direction of the statue commission, composed of the Secretary of War, the Secretary of the Navy, the chairman of the Committee on the Library of the Senate, and the chairman of the Committee on the Library of the House of Representatives, the officer in charge of public buildings and grounds, who is the executive and disbursing officer of the commission, prepared a program of competition which was approved by the commission in April, 1908, and sent out to 25 American artists of Irish descent. It provided that models should be submitted between December 1 and 15, 1908, and in accordance therewith models were submitted by 7 sculptors. The commission held a meeting and viewed the models, but made no selection. At the same meeting the commission decided to place the statue in the center of the west side of Franklin Park.

At a meeting held on February 25, 1909, the commission approved the report of a committee of three experts appointed by it, selecting three of the models as the most meritorious, and awarded prizes to the authors. Later the commission requested the author of the model awarded first prize to submit a new design, from which the architectural features of the model were to be omitted or made less prominent. This the artist consented to do, and his second model was received in this city in June, 1909.

After careful consideration the commission rejected this model as unsatisfactory, and invited Mr. John J. Boyle, of New York, to submit a model for the statue, a contract for the erection of the work to be awarded to him if the model proved satisfactory. His model was submitted in May, 1910, and viewed by a committee of experts, who recommended certain changes in the design of the monument. In the meantime, a permanent National Commission of Fine Arts having been created by Congress, the Barry Commission decided to refer the matter to them for advice. This was done and at a meeting held December 8 the Statue Commission decided to award the contract to Mr. Boyle on condition that he modify his model in accordance with the suggestions of the Commission of Fine Arts. Mr. Boyle accepted this condition and on April 27 sent his new model to Washington for consideration. This was examined and approved by the Commission of Fine Arts on May 19, but the sculptor was asked to make some changes in the proposed setting for the monument. He is now engaged in altering the design of the setting in accordance with the suggestions of the commission.

The amount expended on account of this statue to June 30, 1911, was $2,986.40.

17. STATUE OF JOHN PAUL JONES.

Congress by act approved June 8, 1906, appropriated the sum of $50,000 for the erection in the city of Washington of a statue to the memory of John Paul Jones and for the preparation of a site, and created a commission composed of the Secretary of War, the Secretary of the Navy, the chairman of the Committee on the Library of the Senate, and the chairman of the Committee on the Library of the House of Representatives, to direct the expenditure and to select a site for the statue on ground belonging to the Government other than the grounds of the Capitol or Library of Congress.

The commission in June, 1908, selected a sculptor, Mr. Charles H. Niehaus, and on December 16, 1908, a contract was entered into with him for the execution of the work. In April, 1909, the commission selected a site for the statue at the foot of Seventeenth Street NW., on the shore at the northeast corner of the tidal basin.

On June 5, 1909, the sculptor submitted for consideration by the commission a model of the statue and pedestal, and at a meeting held on June 9 the commission approved the general design of the statue, but decided to ask the sculptor to restudy a portion of the pedestal. The revised model was approved, but a question having arisen in July as to the advisability of changing the adopted site, work upon the erection of the monument was delayed pending action on the matter by the Statue Commission. On December 8 the commission decided to adhere to the site originally adopted, and also authorized an extension of the time limit under the contract with the sculptor sufficient to make good any delay to which he was put by reason of stoppage of work on the foundations pending the commission's decision as to the site. A supplemental contract covering this extension of time to December 16, 1911, was signed by the contracting parties on January 18. The full-size plaster model of the statue was completed by the sculptor early in February, and was approved and accepted by the Statue Commission on March 16. New plans for the architectural setting of the monument were examined and approved by the commission on March 5. The full-size model of the bas-relief for the pedestal was completed by the sculptor in May and accepted by the commission. It is expected that work for constructing the foundation will commence in August.

The amount expended on account of this statue to June 30, 1911, was $6,065.14.

18. MEMORIAL TO CHRISTOPHER COLUMBUS.

By act approved March 4, 1907, Congress appropriated the sum of $100,000 for the erection in this city of a suitable memorial to Christopher Columbus, and created a commission consisting of the chairman of the Senate Committee on the Library of the Fifty-ninth Congress, the chairman of the Committee on the Library of the House of Representatives of the Fifty-ninth Congress, the Secretary of State, the Secretary of War, and the supreme knight of the Order of the Knights of Columbus, with authority to select a site and a suitable design and to contract for and superintend the construction of the memorial.

At a meeting held by the commission on May 18, 1907, the Secretary of War was elected chairman of the commission, and the officer in charge of public buildings and grounds its executive and disbursing officer.

On February 4, 1908, the commission selected as a site for the memorial the plaza in front of the new Union Railroad Station. On March 19, 1908, the commission accepted a design submitted by D. H. Burnham & Co., the architects of the Union Station, for the architectural treatment of the memorial, and on November 16, 1908, entered into contract with that firm for professional services in connection with the erection of the memorial. The commission directed its executive and disbursing officer to prepare a program of competition for the sculpture proposed for the memorial. This was done, the program printed, and copies were sent to all artists applying for it.

In accordance with the program 21 models were submitted by 20 competitors on or before December 1, 1908, and were viewed by the commission on January 8, 1909, but no choice was then made. At its next meeting, held on February 25, the commission selected the model of Mr. Lorado Taft, and also awarded prizes to the authors of the two models placed second and third in order of merit. On March 4, 1910, a contract was entered into with Mr. Taft to furnish models for the sculptural work, exercise supervision over its execution in stone, and superintend its erection. The 1-inch scale model was finished in June, 1910, but its acceptance was postponed to enable some minor changes to be made. These were completed in July, the model was accepted by the commission on December 8, and the sculptor paid the amount due therefor under the terms of the contract. On March 16, 1911, the architects submitted a draft of the detailed specifications under which proposals for the erection of the memorial are to be invited. These were subsequently modified, and on June 26 bids for the erection of the memorial were invited, to be opened July 26. On June 24 the sculptor submitted for the consideration of the commission his full-size models of the crowning motive of the globe and eagles and the lateral sculptural motives forming a part of the center shaft.

The amount expended on acount of this statue to June 30, 1911, was $8,884.17.

19. MONUMENT TO GEN. HUGH MERCER AT FREDERICKSBURG, VA.

This monument was erected in 1905–6 under authority contained in an act of Congress approved June 28, 1902, which appropriated the sum of $25,000 for the purpose. The act provided that the funds should be expended under the direction of the Secretary of War, the city of Fredericksburg to furnish the site. The sculptor is Mr. Edward V. Valentine, of Richmond, Va., who was selected by the Secretary of War to design and erect the monument. The work was done by Mr. Valentine under contract. The site for the monument was conveyed to the United States by the city of Fredericksburg in July, 1905. The erection of the monument was commenced in September, 1905, and completed in February, 1906. The grounds around the monument were improved by this office between April and June, 1906. The improvements consist of a grassed mound, inclosed with a granite coping, around the base of the pedestal, cement walks bordered by cement coping, grassed lawns, and a granite coping and an iron post and chain fence around the four sides of the site. Water pipe was also laid for use in watering the lawns.

20. DISTRICT OF COLUMBIA ARMORY COMMISSION.

Section 17 of the public buildings act approved May 30, 1908, created a commission consisting of the Assistant Secretary of War, the general commanding the militia of the District of Columbia, the officer in charge of public buildings and grounds at Washington, D. C., and the Superintendent of the United States Capitol Building and Grounds, "Which shall cause plans and estimates to be prepared for a suitable armory for the National Guard of the District of Columbia and report the estimated cost thereof to the Congress." The act provided that the plans and estimates be prepared under the supervision of the Secretary of the Treasury and appropriated $2,500 for the expenses of the commission.

The commission selected the firm of Tracy, Swartwout & Litchfield, of New York, to prepare the plans and estimates. These were approved by the Supervising Architect of the Treasury, who was designated by the Secretary of the Treasury to supervise their preparation, as required by the act, and were then submitted by the commission, with its report, to Congress on April 13, 1910.

21. COMMISSION OF FINE ARTS.

By act approved May 17, 1910, Congress created a permanent Commission of Fine Arts, the constitution and duties of which were defined by the act which reads as follows:

> That a permanent Commission of Fine Arts is hereby created to be composed of seven well-qualified judges of the fine arts, who shall be appointed by the President, and shall serve for a period of four years each, and until their successors are appointed and qualified. The President shall have authority to fill all vacancies. It shall be the duty of such commission to advise upon the location of statues, fountains, and monuments in the public squares, streets, and parks in the District of Columbia, and upon the selection of models for statues, fountains, and monuments erected under the authority of the United States and upon the selection of artists for the execution of the same. It shall be the duty of the officers charged by law to determine such questions in each case to call for such advice. The foregoing provisions of this act shall not apply to the Capitol Building of the United States and the building of the Library of Congress. The commission shall also advise generally upon questions of art when required to do so by the President, or by any committee of either House of Congress. Said commission shall have a secretary and such other assistance as the commission may authorize, and the members of the commission shall each be paid actual expenses in going to and returning from Washington to attend the meetings of said commission and while attending the same.
>
> SEC. 2. That to meet the expenses made necessary by this act an expenditure of not exceeding ten thousand dollars a year is hereby authorized.

Pursuant to the authority conveyed by the act the President, on June 15, 1910, appointed the following-named gentlemen to be members of the commission:

D. H. Burnham, Chicago, Ill.
Frederick Law Olmsted, jr., Brookline, Mass.
Thomas Hastings, New York City.
Daniel C. French, New York City.
Francis D. Millet, Washington, D. C.
Cass Gilbert, New York City.
Charles Moore, Detroit, Mich.,

and on June 17, 1910, appointed Col. Spencer Cosby, the officer in charge of public buildings and grounds, secretary of the commission.

Subsequently, in sundry civil act approved June 25, 1910, Congress provided as follows:

> To meet the expenses made necessary by the act approved May 17, 1910, entitled "An act establishing a Commission of Fine Arts," to be disbursed by the officer in charge of public buildings and grounds, on vouchers approved by the commission, who shall be the secretary and shall act as the executive officer of said commission, ten thousand dollars.

A report of its operations during the year will be submitted independently by the commission.

EXTENSION OF BUILDINGS BEYOND THE BUILDING LINES IN THE CITY OF WASHINGTON.

The act of Congress approved March 3, 1891, as amended by the act approved June 21, 1906, requires the approval of the Secretary of War on applications for extensions upon buildings that are to be erected on lands adjoining United States public reservations.

By direction of the Secretary of War this office is charged with the duty of investigating and reporting upon these cases. During the fiscal year ending June 30, 1911, there were no applications of that character referred to this office by the War Department.

OCCUPATION OF PUBLIC GROUNDS BY PRIVATE PARTIES.

[See map in Annual Report for 1894.]

The following reservation, the property of the United States, is now occupied, it is believed, without authority of law:

Reservation No. 186, by the Bethany Chapel of the New York Avenue Presbyterian congregation.

The occupancy of reservation 186 is now under investigation by this office and will be reported upon when completed.

The occupation by private parties of reservation 137 ceased during the past year and its care was assumed by this office.

Reservations Nos. 61, 65, 67, 139, 141, 142, 152, and 164 are occupied under permits granted the owners of the adjacent property by the Chief of Engineers, under authority of the act of Congress approved July 1, 1898. Of these the permits for Nos. 65, 67, 139, 152, and 164 were issued during the fiscal year 1911, after investigation and recommendation by this office.

In addition to the foregoing, there is a valuable piece of United States ground, known as reservation No. 94*a*, lying between Rock Creek and Twenty-eighth street west, between I and K streets north, of which certain persons are now in unlawful occupation. This office has for several years been making efforts to secure possession of the property, which have so far proved unsuccessful. In December, 1909, this matter was again brought to the attention of the United States attorney for the District of Columbia, and from information received from the Department of Justice it is believed that it will soon be decided in the courts.

The following leases and licenses granting the use of portions of the public grounds to private parties were executed by the Chief of Engineers during the year:

March 1, 1911.—Lease to Columbus Hunting Club of a portion of square south of square 1140, Washington, D. C., with the right to erect and maintain thereon a shooting trap for practicing shooting at inanimate objects. Consideration, $5 per annum, payable in advance.

May 22, 1911.—License to S. Howison for the use, as a truck garden, of United States reservation 244, at Potomac Avenue, Half and R Streets SW., Washington, D. C. Consideration, $10 per annum, payable semiannually in advance.

May 22, 1911.—License to George A. Norris for the use, as a truck garden, of United States reservation 243, at Potomac Avenue, Second, and R Streets SW., Washington, D. C. Consideration, $10 per annum, payable semiannually in advance.

June 9, 1911.—Lease to vestry of Washington Parish for the use for storage purposes of a portion of square 1152, Washington, D. C. Consideration, $20 per annum, payable in advance.

June 17, 1911.—License to Thos. W. Smith for the use, as a roadway and for storage purposes, of a portion of United States reservation 248, at Potomac Avenue, First and O Streets SE. Consideration, $80 per annum, payable quarterly in advance.

DISTRIBUTION OF EXPENDITURES.

The following summary shows in tabulated form the various expenditures and liabilities incurred during the fiscal year for each separate work under the charge of this office:

Work.	Expenditures and liabilities.
General office expenses	$7,239.46
Improvement and care of parks, including the propagating gardens	224,464.19
Care and repair of Executive Mansion, grounds, and greenhouses	66,248.65
Improvement and maintenance of telegraph line connecting the Capitol with the executive departments and the Government Printing Office	500.00
Furnishing trees and plants for grounds of executive departments, Library of Congress, and Capitol	4,989.42
Care and maintenance of Washington Monument	11,813.70
Maintenance of highway bridge across the Potomac River, D. C	15,711.66
Repair of house where Abraham Lincoln died	172.34
Driveway, War Department branch printing office, 1911	1,072.80
Improvements at Wakefield, Va., the birthplace of Washington	44.25
Memorial to Gen. Ulysses S. Grant	8,900.00
Statue of Gen. von Steuben	23,000.59
Unveiling statue of Gen. Baron von Steuben	2,470.54
Monument to Commodore John Barry	1.13
Monument to John Paul Jones	6,032.12
Memorial to Christopher Columbus	5,225.62
Total	377,886.47

Estimates for fiscal year ending June 30, 1913.

Office of Public Buildings and Grounds:	
Superintendent	$3,000
Assistant and chief clerk	2,400
Clerk of class 4	1,800
Clerk of class 3	1,600
Clerk and stenographer	1,400
Clerk of class 1	1,200
Messenger	840
(1) Landscape architect	3,000
Surveyor and draftsman	1,500
For foremen, gardeners, mechanics, and laborers employed in the public grounds	31,200
For 1 sergeant of park watchmen	950
For second sergeant of park watchmen	900
For day watchmen, as follows: One in Franklin Park and adjacent reservations on New York Avenue; 1 in Lafayette Park; 2 in Smithsonian grounds and neighboring reservations; 1 in Judiciary Park; 1 in Lincoln Park and adjacent reservations; 1 in Iowa Circle and reservations to the northeast; 1 in Thomas and Scott Circles and neighboring reservations; 1 in Washington Circle and neighboring reservations; 1 in Du Pont Circle and neighboring reservations; 1 in McPherson Park and Farragut Square; 1 in Stanton Park and neighboring reservations; 2 in Henry and Seaton Parks and neighboring reservations; 1 in Mount Vernon Park and reservations to the northeast; 1 in grounds south of the Executive Mansion; 1 in Garfield and Marion Parks and reservations to the east; 1 in Monument Park, and 3 in Potomac Park, 21 in all, at $720 each	15,120
For night watchmen, as follows: Two in Smithsonian grounds and neighboring reservations; 1 in Judiciary Park; 2 in Henry and Seaton Parks and adjacent reservations; 1 in grounds south of the Executive Mansion; 1 in Monument Park; 1 in Garfield Park and neighboring reservations; 1 in Iowa, Scott, and Thomas Circles and neighboring reservations; 1 in Stanton and Lincoln Parks and neighboring reservations; 1 in Lafayette and McPherson Squares and Franklin and Farragut Parks; 1 in Washington and Du Pont Circles and neighboring reservations; 1 in Mount Vernon Park and neighboring reservations; 2 for greenhouses and nursery; and 4 in Potomac Park, 19 in all, at $720 each	13,680

Office of Public Buildings and Grounds—Continued.		
For watchman for the care of the monument and dock at Wakefield, Va., the birthplace of Washington	$300	
For contingent and incidental expenses, including purchase of professional and scientific books and periodicals, books of reference, blank books, photographs, and maps	700	
For purchase and repair of bicycles and revolvers for park watchmen and for purchase of ammunition	400	
For purchasing and supplying uniforms to park, Monument, and bridge watchmen	2,800	
(2) For purchase of steel cases for old records in Office of Public Buildings and Grounds	800	
Total under legislative act		$83,590
Buildings and grounds in and around Washington:		
For improvement and care of public grounds, District of Columbia, as follows—		
For improvement and maintenance of grounds south of Executive Mansion	4,000	
For ordinary care of greenhouses and nursery	2,000	
For repair and reconstruction of the greenhouses at the nursery	3,000	
For ordinary care of Lafayette Park	2,000	
For ordinary care of Franklin Park	1,500	
For improvement and ordinary care of Lincoln Park	2,000	
For care and improvement of Monument Grounds and annex	7,000	
For improvement, care, and maintenance of Garfield Park	2,500	
For construction and repair of post-and-chain fences, repair of high iron fences; constructing stone coping about reservation; painting watchmen's lodges, iron fences, vases, lamps, and lamp-posts; repairing and extending water pipes and purchase of apparatus for cleaning them; hose; manure, and hauling the same; removing snow and ice; purchase and repair of seats and tools; trees, tree and plant stakes, labels, lime, whitewashing, and stock for nursery, flower pots, twine, baskets, wire, splints, moss, and lycopodium, to be purchased by contract or otherwise, as the Secretary of War may determine; care, construction, and repair of fountains; abating nuisances; cleaning statues and repairing pedestals	18,550	
For improvement, care, and maintenance of various reservations, including purchase, maintenance, and driving of horse and vehicle for official use of the officer in charge of public buildings and grounds, and of other necessary vehicles for official use	30,000	
For improvement, care, and maintenance of Smithsonian grounds	3,000	
For improvement and maintenance of Judiciary Park	2,500	
For laying cement and other walks in various reservations	2,000	
For broken-stone road covering for parks	3,500	
For curbing, coping, and flagging for park roads and walks	2,000	
For care and maintenance of Potomac Park	15,000	
(3) For grading, soiling, seeding, and planting that portion of Potomac Park west of the railroad embankment, and constructing roads, paths, and shelters	75,000	
For oiling or otherwise treating macadam roads	4,000	
(4) For commencing the improvement of the portion of Potomac Park east of the railroad embankment	25,000	
(5) For commencing the improvement of Montrose Park and for its care and maintenance	10,000	
(6) For commencing the improvement of Meridian Hill Park	25,000	
(7) For laying cement pavement on the sidewalks on East and West Executive Avenues and south of the Treasury Department Building	6,000	
(8) For grading and improving the portions of Seaton Park bordering Sixth Street NW	5,000	
(9) For constructing fountain in reservation on Pennsylvania Avenue	3,000	

Buildings and grounds in and around Washington—Continued.		
For improvement and care of public grounds, District of Columbia, as follows—Continued.		
For improvement, care, and maintenance of grounds of executive departments	$1,000	
For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Library of Congress as may be requested by the superintendent of the Library Building	1,000	
For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Capitol and the Senate and House Office Buildings as may be requested by the Superintendent of the Capitol Building	4,000	
For improvement and maintenance of Executive Mansion grounds (within iron fence)	5,000	
For the employment of an engineer by the officer in charge of public buildings and grounds	2,400	
For purchase and repair of machinery and tools for shops at nursery and for the repair of shops and storehouse	1,000	
		$267,950
Executive Mansion:		
For ordinary care, repair, and refurnishing of Executive Mansion, and for purchase, maintenance, and driving of horses and vehicles for official purposes, to be expended by contract or otherwise, as the President may determine	35,000	
For fuel for the Executive Mansion, greenhouses, and stable	6,000	
For care and maintenance of greenhouses, Executive Mansion	9,000	
For repairs to greenhouses, Executive Mansion	3,000	
For lighting the Executive Mansion, the grounds, the greenhouses, and the stables, including all necessary expenses of installation, maintenance, and repair, $8,600, or so much thereof as may be necessary	8,600	
		61,600
Lighting and heating for the public grounds:		
For lighting the public grounds, watchmen's lodges, offices, stable, and greenhouses at the propagating gardens, including all necessary expenses of installation, maintenance, and repair.	15,800	
For heating offices, office stable, watchmen's lodges, and greenhouses at the propagating gardens	3,820	
		19,620
Telegraph to connect the Capitol with the departments and Government Printing Office: For care and repair of existing lines		500
(10) Unveiling Columbus Memorial: For unveiling and dedicating the Columbus Memorial, and for each and every purpose connected therewith, including erecting and taking down stands and putting the grounds in sightly condition, to be available until expended		2,500
Washington Monument:		
For the care and maintenance of the Washington Monument, namely—		
1 custodian, at $100 per month	1,200	
1 steam engineer, at $80 per month	960	
1 assistant steam engineer, at $70 per month	840	
1 fireman, at $55 per month	660	
1 assistant fireman, at $55 per month	660	
1 conductor of elevator car, at $75 per month	900	
1 attendant on floor, at $60 per month	720	
1 attendant on top floor, at $60 per month	720	
3 night and day watchmen, at $60 per month each	2,160	
	8,820	
For fuel, lights, oil, waste, packing, tools, matches, paints, brushes, brooms, lanterns, rope, nails, screws, lead, electric lights, heating apparatus, oil stoves for elevator car and upper and lower floors, repairs to engines, boilers, dynamos, elevator, and repairs of all kinds connected with the Monument and machinery, and purchase of all necessary articles for keeping the Monument, machinery, elevator, and electric plant in good order	3,000	
		11,820

Repairs of building where Abraham Lincoln died: For painting and miscellaneous repairs	$200
Improvements, Wakefield, Va.: For repairs to fences and cleaning up and maintaining grounds about the monument	100
Total under sundry civil act	364, 290

Highway Bridge across Potomac River:	
2 draw operators, at $1,020 each	2, 040
Draw operator	720
(11) 4 watchmen, at $720 each	2, 880
Labor	1, 500
Lighting, power, and miscellaneous supplies, and expenses of every kind necessarily incident to the operation and maintenance of the bridge and approaches	9, 340
	16, 480

The details of the estimate for Highway Bridge are as follows:

2 draw operators, at $1,020 each	$2,040	
1 draw operator	720	
4 watchmen, at $720 each	2,880	
Labor for cleaning roadway, etc	1,500	
Total for regular services		7, 140
Current for operating 6,000 openings, at 9 cents each		540
Lighting 48 arc lights, at $85 per annum each		4, 080
Lighting 20 gas burners, at $20.85 per annum each		417
Telephone service		63
Fuel for heating operating house		65
Miscellaneous supplies (grease, oil, waste, etc.)		375
Painting and repairs		3, 300
Contingencies (additional labor, etc.)		500
Total under District of Columbia act		16, 480

EXPLANATION OF ESTIMATES, PUBLIC BUILDINGS AND GROUNDS, WASHINGTON, D. C., FOR FISCAL YEAR ENDING JUNE 30, 1913.

For those of the preceding estimates that are larger than amounts heretofore appropriated, and for those that are new, the following explanations are submitted:

1. An increase is recommended in the pay of the landscape architect from $2,400 to $3,000 per annum. The present compensation of this position is not commensurate with its duties and responsibilities, which have been greatly increased during the past few years. The problems involved in laying out the large areas in Potomac Park and in designing the improvements for Montrose and Meridian Hill Parks, just added to the system, call for a higher degree of skill than has heretofore been necessary in the landscape architect. It is absolutely essential that he should be a trained and experienced expert if the parks of Washington are to be, as they should, a model for the rest of the country. Such an expert is difficult to get and keep at the present salary.

2. The sum of $800 is asked for with which to purchase steel cases for the old records in this office. These consist of the land records, letters, account books, and other records of the commissioners who were appointed by President Washington to lay out and create the Federal city. These records are exceedingly valuable, as the titles to all land in the city of Washington start with them; they are now kept in ordinary wooden cases in a building which is only partially fireproof. The records are being constantly examined by lawyers,

title insurance companies, and others. Their destruction would cause endless embarrassment and be irreparable. Means for their better protection should be provided without further delay, and an appropriation for the purpose is urgently recommended.

3. The estimates of this office for 1912 for grading, soiling, constructing roads, etc., in West Potomac Park amounted to $100,000, but only $25,000 was appropriated. This sum will allow a comparatively small amount of work to be done toward the necessary improvement of the many acres of this park, which have so far hardly been touched. The $75,000 now asked for is urgently needed to improve and make available for the use of the public one of the most popular and beautiful parks in Washington.

4. It is desired to open to the public a portion of Potomac Park east of the railroad embankment, and $25,000 is requested to commence its improvement.

5. Montrose Park, the only park in Georgetown, has recently been purchased at a cost of $110,000, but no money has been appropriated or is available for its maintenance and improvement.

6. Negotiations are now under way for the acquisition, for park purposes, of land at Sixteenth Street and Florida Avenue, and the sum of $490,000 has been appropriated for the purpose in the general deficiency act approved March 4, 1911. No money has, however, been appropriated for the improvement and maintenance of this park when acquired.

7. An estimate is submitted of $6,000 for replacing the old stone flag pavements of the sidewalks on the avenues east and west of the White House and south of the Treasury with cement pavements. The flag pavements are many years old and have been so much damaged by wear and weather that they are unsightly and should be replaced with new pavements.

8. Five thousand dollars is asked for grading the east side of Sixth street in Seaton Park. There are still high embankments on both sides of the park road at this point, which are very unsightly and should be graded, soiled, and seeded. An estimate for grading the site of the old Pennsylvania Railroad depot at Sixth and B Streets and the ground west of it is not included, because of the possibility of the new armory occupying those grounds.

9. An estimate of $3,000 is submitted for an ornamental fountain to be erected at Pennsylvania Avenue and Eighth Street, where it will be seen and enjoyed by the large number of people who pass there daily during the hot summer months.

10. An estimate of $2,500 is submitted for unveiling the memorial to Christopher Columbus, for the construction of which Congress appropriated $100,000 by act approved March 4, 1907. It is expected that the memorial will be ready for unveiling in May, 1912. It is therefore recommended that the sum asked for be made immediately available.

11. An increase is recommended in the salary of the four watchmen employed at the Highway Bridge from $600 a year each to $720. These watchmen have arduous duties of a police nature to perform and should be paid the same amount as the park watchmen, who have similar duties. Great difficulty is being found in securing capable and able-bodied men to fill the position at the present rate of pay.

Abstract of contracts in force during the fiscal year ending June 30, 1911, under the Office of Public Buildings and Grounds, Washington, D. C.

Contractors: United States Casualty Co. of New York, N. Y., for making monthly inspections of the elevator in the Washington National Monument.
Date of Contract: June 30, 1910.
Approved: Emergency contract.
Date of commencement: July 1, 1910.
Date of completion: June 30, 1911.
Rate and amount: $36 for making 12 monthly inspections of elevator during fiscal year ending June 30, 1911.

Contractor: Henry F. Michell, of Philadelphia, Pa., for furnishing bulbs for public grounds and greenhouses of Executive Mansion, Washington, D. C.
Date of contract: July 1, 1910.
Approved: July 16, 1910.
Date of commencement: September 1, 1910.
Date of completion: January 1, 1911.
Amount of contract: $1,075.

Contractors: Potomac Electric Power Co., of Washington, D. C., for furnishing current and lights for Highway Bridge and public grounds, District of Columbia.
Date of contract: July 1, 1910.
Approved: July 19, 1910.
Maintenance and service to be provided during fiscal year ending June 30, 1911.
Rate and amount: $85 per lamp per annum for 132 lamps; 6 cents per kilowatt hour for current.

Contractors: American Street Lighting Co., of Baltimore, Md., for lighting the public grounds and Washington Channel Bridge, Washington, D. C., with high-candle-power gas lights.
Date of contract: July 6, 1910.
Approved: July 29, 1910.
Maintenance and service to be continued during fiscal year ending June 30, 1911.
Rate and amount: To furnish, operate, and maintain 228 gas lamps, containing a total of 246 mantle gas burners at locations mentioned in the specifications, at $20.80 per burner per annum.

Contractors: National Mortar Co., of Washington, D. C., for furnishing and delivering broken trap rock and crushed limestone for constructing and repairing roadways in public parks, Washington, D. C.
Date of contract: August 18, 1910.
Approved: Emergency contract.
Date of commencement: First week in September, 1910.
Date of completion: November 1, 1910.
Rate and amount: 2,270 tons of trap rock at $1.92 per ton of 2,000 pounds, and 200 tons of crushed limestone at $1.51 per ton of 2,000 pounds.

Contractors: Good Roads Improvement Co., of Cincinnati, Ohio, for furnishing and delivering road oil for public grounds, District of Columbia.
Date of contract: September 1, 1910.
Approved: Emergency contract.
Date of commencement: September 11, 1910.
Date of completion: June 30, 1911.
Rate and amount: 30,000 gallons of road oil, at 6½ cents per gallon.

Contractors: Barrett Manufacturing Co., of Philadelphia, Pa., for furnishing and delivering tarvia for public grounds, Washington, D. C.
Date of contract: September 8, 1910.
Approved: Emergency contract.
Date of commencement: September 10, 1910.
Date of completion: June 30, 1911.
Rate and amount: 10,000 gallons of tarvia, at $6\frac{3}{10}$ cents per gallon.

Contractor: Martin F. McNamara, of Washington, D. C., for removing stone from grounds in Potomac Park, D. C.
Date of contract: March 20, 1911.
Approved: Emergency contract.
Service to be performed by May 15, 1911.
Rate and amount: $675 for work complete.

Contractors: American Street Lighting Co., of Baltimore, Md., supplemental contract for reduction of charge for high-candlepower gas lamps in public grounds, District of Columbia.

Date of contract: April 20, 1911.

Approved by Chief of Engineers May 6, 1911; by Assistant Secretary of War, May 10, 1911.

Date of commencement: January 1, 1911.

Date of completion: June 30, 1911.

Rate and amount: The rate to be a reduction the same as that allowed the Commissioners of the District of Columbia for like services.

Financial statement for fiscal year ending June 30, 1911.

Title of appropriation.	Available at beginning of fiscal year.	Expended during fiscal year.	Outstanding liabilities June 30, 1911.	Pledged by contract.	Unexpended balances.
Improvement and care of public grounds, District of Columbia, 1911	$131,550.00	$119,528.06	$12,003.49	....	$18.45
Improvement and care of public grounds, 1911	15,900.00	14,601.43	1,239.21	....	59.36
Repairs, fuel, etc., Executive Mansion, 1911	53,000.00	50,899.06	1,352.62	....	748.32
Lighting, etc., Executive Mansion, etc., 1911	18,020.00	13,637.15	4,083.65	....	299.20
Lighting public grounds, District of Columbia, 1911	10,200.00	3,371.20	5,739.02	....	1,089.78
Telegraph to connect the Capitol with the departments and the Government Printing Office, 1911	500.00	437.25	62.75	....	....
Contingent expenses, public buildings and grounds, 1911	1,100.00	971.20	128.26	....	.54
Salaries of employees, public buildings and grounds, 1911	76,490.00	71,313.49	4,073.88	....	1,102.63
Care and maintenance of the Washington Monument, 1911	11,820.00	10,301.36	1,512.34	....	6.30
Repair of building where Abraham Lincoln died, 1911	200.00	98.64	73.70	....	27.66
Improvements birthplace of Washington, Wakefield, Va., 1911	100.00	44.25	....	....	55.75
Maintenance of Highway Bridge across Potomac River, D. C., 1911	16,000.00	10,590.58	5,121.08	....	288.34
Driveway War Department branch printing office, 1911	1,075.00	1,072.80	....	....	2.20
Memorial to Gen. Ulysses S. Grant	82,474.84	8,900.00	....	$73,574.84	....
Monument to Gen. Baron von Steuben	23,360.20	23,000.59	....	....	359.61
Monument to John Paul Jones	49,966.98	6,032.12	....	43,000.00	934.86
Monument to Commodore John Barry	47,016.73	1.13	....	....	47,015.60
Memorial to Christopher Columbus	96,252.48	5,225.62	....	19,750.00	71,276.86
Unveiling statue of Gen. Philip Sheridan	234.94	....	....	....	234.14
Unveiling statue of Gen. Baron von Steuben	2,500.00	2,470.50	....	....	29.46
Plans for armory, National Guard, District of Columbia	205.51	....	....	....	205.51

Very respectfully,

SPENCER COSBY,
Colonel, United States Army, Major, Corps of Engineers.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

APPENDIX F F F.

NORTHERN AND NORTHWESTERN LAKES (CORRECTING AND ISSUING CHARTS—SURVEYS—WATER LEVELS)—PRESERVATION OF NIAGARA FALLS.

REPORT OF LIEUT. COL. C. S. RICHÉ, CORPS OF ENGINEERS, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

UNITED STATES LAKE SURVEY OFFICE,
Detroit, Mich., July 17, 1911.

SIR: I have the honor to submit herewith the annual report of the works under my charge in the Detroit, Mich., district, during the fiscal year ending June 30, 1911.

Very respectfully, your obedient servant,

C. S. RICHÉ,
Lieutenant Colonel, Corps of Engineers.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

F F F 1.

SURVEY OF NORTHERN AND NORTHWESTERN LAKES.

As early as 1816 local surveys of the Great Lakes for special purposes were made by engineer officers, but the survey of the Northern and Northwestern Lakes as a connected and systematic whole was commenced in 1841 and prosecuted continuously until 1882, when work was suspended, as the data then in hand seemed sufficient for the requirements of navigation of the period. After the suspension and until 1889 operations were limited to the publication and issue of charts, $2,000 or $3,000 being appropriated annually for this work. In 1889 field operations were resumed under an appropriation made therefor, and have been continued under annual appropriations ranging from $5,000 to $150,000. In 1898 these operations were extended to include observations and investigations of lake levels with a view to ascertaining the causes of changes in level, determining the hydraulic data needed for formulating the laws of interlake flow and devising the most feasible method of lake-level maintenance or regulation.

The sundry civil act of March 4, 1911, provided that the survey of Northern and Northwestern Lakes be extended to include the lakes and other natural navigable waters embraced in the navigation system of the "New York canals."

Operations during the fiscal year have included work related to the several features above referred to, as follows:

Charts.—The reduction, preparation, and reproduction of charts have continued under the immediate supervision and direction of Assistant Engineer Edward Molitor, to whom great credit is due for the quality and quantity of work done.

The following statement shows the number of charts received and disposed of at this office during the fiscal year ending June 30, 1911:

On hand, July 1, 1910	37,807
Received from office files	17
Received from office of Chief of Engineers	12
Prepared by this office	31,450
Total	69,286
Sold	13,281
Issued for official use	3,254
Transferred to United States engineer office, Buffalo	2,805
Destroyed (out of date)	567
On hand, July 1, 1911	49,379
Total	69,286

The total number of charts sold by this office during the year was 13,281, the total amount received from these sales being $2,059.87, which was duly deposited to the credit of the Treasurer of the United States. The total number of charts that have been sold, issued, and transferred through this office to June 30, 1911, is 426,144, including those transferred to the United States engineer office at Buffalo.

Of the five general charts of the Great Lakes published by the Lake Survey from copperplates loaned by the Hydrographic Office, United States Navy, 341 were issued, 130 transferred to Buffalo, 4 canceled, and 611 sold for a total of $109.95. These figures are included in the above statements.

The revision of charts accomplished during the year embraced changes in aids to navigation, modifications due to river and harbor improvements, latest magnetic determinations, additional and corrected sailing courses, and the most prominent topographic and hydrographic changes developed by commercial and industrial enterprise on the shores of the lakes and their tributary and connecting waters. In all cases where geodetic control had not already been referred to the standard datum of 1901, the revisions included this change, and, whenever time permitted, soundings were referred to the standard low-water planes approved March 16, 1909. The changes constantly being made in lights and buoys, pier extension, breakwater construction, etc., render necessary a large amount of handwork, as every chart is corrected so far as practicable for all information received to the day of issue.

In the statement of work on charts given below, the edition number has reference only to the editions lithographed in colors, many charts having previously appeared as black prints from the original engraved copperplates. Copies of charts were revised, the original engravings on stone or copperplate correspondingly corrected, transfers to stone made, color plates prepared, and the charts printed in colors, as follows:

1. St. Marys River No. 2; scale 1:40,000; seventh edition; from heliogravure copperplates. Printed in five colors; issued July 15, 1910.
2. St. Lawrence River No. 2; scale 1:30,000; second edition; from engraved copper plate. Printed in five colors; issued August 8, 1910.

3. **Menominee Harbor, Mich., and Wis. (including Menominee and Marinette); scale 1:15,000; from engraving on stone; second edition. Printed in three colors; issued August 22, 1910.**
4. Thunder Bay, Lake Huron; scale 1:40,000; second edition; from engraved copperplate. Printed in three colors; issued September 15, 1910.
5. General Chart of Lake Huron; scale 1:400,000; third edition; from engaving on stone. Printed in five colors; issued October 20, 1910.
6. Lake St. Clair; scale 1:50,000; sixth edition; from engraved and heliogravure copperplates. Printed in five colors; issued October 21, 1910.
7. Coast chart No. 7, Lake Erie; scale 1:80,000; fourth edition; from engraved copperplate. Printed in five colors; issued October 29, 1910.
8. Little Bay de Noc, Mich. (with insets of Escanaba and Gladstone Harbors); scale 1:40,000 and insets 1:20,000; second edition; from Molitor-process copperplates. Printed in five colors; issued October 29, 1910.
9. Presque Isle, False Presque Isle, and Middle Island, Mich.; scale 1:40,000; second edition; from Molitor-process copperplates. Printed in three colors; issued October 31, 1910.
10. Straits of Mackinac; scale 1:120,000; reprint from partially revised copperplate to supply demand until completion of new chart. Printed in five colors; issued November 18, 1910.
11. North End of Green Bay (with insets of Nahma and Cedar River, Mich.); scale 1:120,000, 1:15,000, 1:16,000, respectively; third edition; from engraved copperplate. Printed in five colors; issued November 21, 1910.
12. St. Marys River No. 3; scale 1:40,000; sixth edition; from heliogravure copperplates. Printed in five colors; issued January 18, 1911.
13. Coast chart No. 5, Lake Michigan; scale 1:80,000; third edition; from engraved copperplate. Printed in five colors; issued January 31, 1911.
14. Manistee Harbor, Mich.; scale 1:10,000; second edition; from Molitor-process copperplates. Printed in four colors; issued February 15, 1911.
15. Cleveland Harbor, Ohio; scale 1:12,000; fourth edition; from heliogravure copperplates. Printed in five colors; issued March 7, 1911.
16. St. Clair River; scale 1:40,000 (with inset of Algonac, Marine City, and St. Clair; scale 1:16,000); third edition; from stone engraving. Printed in five colors; issued May 10, 1911.
17. General Chart of Lake Michigan; scale 1:500,000; sixth edition; from heliogravure copperplates. Printed in five colors; issued May 31, 1911.
18. Manitowoc Harbor, Wis.; scale 1:8,000; second edition; from Molitor-process copperplates. Printed in three colors; issued June 7, 1911.
19. St. Lawrence River No. 1; scale 1:30,000; third edition; from engraved copperplate. Printed in five colors; issued June 10, 1911.

At the close of the year work was in progress on the revision of the following charts and the corresponding correction of engravings on copperplate or stone, preparatory to new editions:

1. Coast chart No. 4, Lake Michigan; scale 1:80,000; for second edition; from copperplate.
2. General chart of Northern and Northwestern Lakes; scale 1:1,200,000; for fourth edition; from engraving on stone.
3. Detroit River; scale 1:40,000; for ninth edition; from copperplate.
4. General chart of Lake Superior; scale 1:500,000; for seventh edition; from heliogravure and Molitor-process copperplates.
5. South End of Green Bay; scale 1:120,000; for third edition; from copperplate.
6. Les Cheneaux Islands, Mich.; scale 1:40,000; for second edition; from engraving on stone.
7. Keweenaw Bay, Lake Superior; scale 1:30,000; second edition; from copperplate.
8. Muskegon Harbor, Mich.; scale 1:15,000; third edition; from Molitor-process copperplates.
9. Portage Lake and River, Lake Superior; scale 1:30,000; third edition; from copperplates.
10. Coast chart No. 1, Lake Erie; scale 1:80,000; third edition; from copperplate.

The following entirely new charts, engraved on stone, were completed and issued in colors during the year:

1. Buffalo Harbor and Niagara River to the Falls; scale 1:30,000; new engraving on stone for fifth edition, embracing extensive hydrographic and topographic changes that could not well be made on former heliogravure copperplates. Printed in five colors; issued August 5, 1910.
2. Kenosha Harbor, Wis.; scale 1:10,000; based on survey of 1909. Printed in three colors; issued December 7, 1910.

The following new charts are being engraved on stone, and at the close of the fiscal year the work had progressed as stated below:

1. Straits of Mackinac (Presque Isle, Lake Huron, to Charlevoix, Lake Michigan, including Detour and False Detour Passages); scale 1:120,000. From compilation of old and new surveys. Ready for printing.
2. Beaver Island Group, including north shore of Lake Michigan from Waugoshance Point to Seul Choix Point; scale 1:80,000. From compilation of old and recent surveys. Ready for printing.
3. Chicago Lake Front No. 2 (from Hyde Park, Ill.; to Gary, Ind.); scale 1:40,000. From recent surveys and compilation of surveys furnished by United States Engineer office, Chicago. Nearly ready for printing.
4. Chicago Lake Front No. 1 (from Glencoe to Hyde Park, Ill.); scale 1:40,000. From recent surveys and compilation of surveys furnished by United States Engineer office, Chicago. Ready for printing in near future.
5. Coast chart No. 6, Lake Michigan (from South Haven to Benona, Mich.); scale 1:120,000. New coast chart under project approved April 17, 1909. Engraving about one-fourth completed.
6. Islands in Lake Erie; scale 1:40,000; under project approved April 17, 1909. Projection only has been engraved.
7. Coast chart No. 5, Lake Michigan (from Waukegan, Ill., to South Haven, Mich.); scale, 1:120,000. New coast chart under project approved April 17, 1909. Awaiting additional surveys.

The following small charts, not included in the regular Lake Survey series, were prepared as insets in supplements to Bulletin No. 19, and for issue with affected charts:

1. Magnetic chart of Lake Superior; scale, 1:200,000; from observations made by the Duluth United States engineer office, 1902, 1903, 1904, and 1906; by the Lake Survey, Coast and Geodetic Survey, and Canadian Hydrographic Survey, 1902 to 1910; reduced to 1910 by allowing a change of two minutes of arc yearly, westerly variations increasing, easterly variations decreasing. Printed in three colors and issued as inset in Supplement No. 3 to Bulletin No. 19; July, 1910.
2. Potagannissing Bay and Detour Passage; scale 1:40,000; showing new shoals; based on examinations made in August and October, 1910. Printed in three colors and issued as inset to Supplement No. 7 to Bulletin No. 19; November, 1910.

In addition to the foregoing, the following miscellaneous work was done during the year:

1. Letter heads for office and field use of the Lake Survey; edition of 6,000 printed from previously prepared engravings; December, 1910.
2. Index map for catalogue of charts; from engraving on stone; seventh edition, showing limits of Lake Survey charts in red and of Hydrographic Office charts in blue. Issued in February, 1911.
3. Hydrograph showing monthly mean water levels of the Great Lakes from 1860 to date; from engraving on stone; 200 printed in May, 1911.

The work of chart production is that of expert specialists for whose employment there is little commercial demand. Because of this fact the expert services required exist only in a very limited number of Government offices. The Lake Survey office is therefore able to perform the work of producing finished charts not only cheaper, but better than this can be done by even the largest commercial lithographers, and accordingly in special cases, with the approval of the

Chief of Engineers, the services of this office have been employed by engineer officers elsewhere for the reproduction of various maps and for other purposes. All expenses incurred in this class of work are paid for by the offices for which the work is done, either by direct allotment or by reimbursement effected through a Treasury settlement. During the year the following outside work was accomplished:

(*a*) For the Mississippi River Commission:
Editions of 500 each of charts Nos. 252 to 261, inclusive, of the Mississippi River; 480 of each on paper and 20 of each on tracing vellum; printed in black. December, 1910.

(*b*) For the Niagara Falls committee:
Large and small size letterheads and envelopes, embossed from steel engravings; 200 each of large and small letterheads and 100 each of large and small size envelopes, printed by hand on steel-plate embossing press. February, 1911.

(*c*) For United States engineer office, Detroit, Mich.:
Vicinity of Sault Ste. Marie, Mich., and Ontario, showing American and Canadian canals; scale 1:15,000. Revised reprint from engraving on stone for inset in Statistical Report of Lake Commerce through the canals during season of 1910. Two thousand copies, printed in three colors. March, 1911.

(*d*) For various engineer offices:
Cross-section paper, 16 by 20 inches, inch divided to tenths; from engraving on stone. This paper is supplied to other offices, as ordered, at a price of 7 cents per sheet.

(*e*) Under appropriation "Maps, War Department, 1911," see report on "Maps, War Department."

Hydrographic Office charts.—Under the terms of the agreement noted on page 2703 of the annual report for 1910, the Lake Survey office transferred from copperplates to stone, corrected Aids to Navigation to date on transfer stones, and lithographed in five colors:

1. General chart of Lake Superior.
2. General chart of Lake Huron and Georgian Bay.
3. General chart of Lake Michigan.
4. General chart of Lakes Ontario and Erie (one sheet).

All of the above were placed on sale July 28, 1910.

This completes the publication of the five general charts of the Lakes from copperplates loaned by the Hydrographic Office, United States Navy, the general chart of Lake Erie having been issued during the previous year.

The Lake Survey series originally consisted of 76 charts, all of which were printed in black from copperplates. As a result of revisions, additions, and cancellations there are now in force 122 charts, of which 1 is printed in black from copperplate (Niagara Falls, scale 1:20,000), 77 are lithographs in colors from copperplate transfers, 43 are lithographs in colors from stone engravings, and 1 is a photolithograph in colors.

Of the entire series of charts, there had been issued in colors 5 on July 1, 1900; 12 on July 1, 1901; 30 on July 1, 1902; 49 on July 1, 1903; 59 on July 1, 1904; 73 on July 1, 1905; 97 on July 1, 1906; 110 on July 1, 1907; 117 on July 1, 1908; 122 on July 1, 1909; 124 on July 1, 1910; and 126 on July 1, 1911, including the 5 general charts formerly published by the Hydrographic Office of the Navy.

In 1901 the Coast and Geodetic Survey, with the collaboration of the Lake Survey, made a recomputation of the primary triangulation systems of the United States, adjusting the same into one homogeneous net. The result of this adjustment is to give one standard reference or geodetic datum throughout the United States in place of a separate reference for each fragmentary triangulation system. The recomputed geodetic values of the Lake Survey triangulation, so far as it was complete at the time, are published on pages 2905–3031, Report of the Chief of Engineers for 1902, and the datum or reference upon which these are based has been adopted for the projection of Lake Survey charts.

Likewise in 1903 the Coast and Geodetic Survey readjusted the numerous interconnecting level lines in the United States into one homogeneous system. The adjusted elevations of such lines as pertain to the region of the Great Lakes are published in the Annual Report for 1903, pages 2688–2744.

The standard low-water planes which were adopted for each of the lakes in 1901 were slightly modified by direction of the Chief of Engineers on March 16, 1909, to conform to the level adjustment of 1903 while fulfilling the original intent of expressing in round numbers planes safely below the lowest monthly means of record.

The standard low-water planes, in feet above mean tide at New York, are as follows:

Lake Superior, at Marquette	600. 5
Lake Huron, at Harbor Beach	578. 5
Lake Michigan, at Milwaukee	578. 5
Lake Erie, at Cleveland	570. 0
Lake Ontario, at Oswego	243. 0

Since the adoption of standards all new charts have been projected upon the standard geodetic datum and their soundings have been referred to the appropriate standard low-water plane. The work of revising the old charts to these standards or replacing them with newly engraved charts, according to the project approved April 17, 1909, is being advanced as rapidly as time will allow. On June 30, 1911, of the current issue of 122 charts, 65 are referred to the standard geodetic datum and 69 have their soundings reduced to standard low-water plane.

The five general charts of the Hydrographic Office, which are on the Mercator projection, have soundings referred to mean summer levels.

Bulletins.—The bulletins of the Survey of Northern and Northwestern Lakes contain important data and information supplementary to the charts, but of too voluminous a character to be incorporated thereon, and they are accordingly issued free in connection with the charts. Bulletin No. 12, of 1902, and those preceding it were printed in Washington, but on July 10, 1902, the entire work of printing and issuing bulletins and supplements thereto was turned over to this office. Since then the subject matter has been edited and its publication (under contract) supervised by Mr. O. C. Hattery.

The numbers published during the year are as follows: Supplements Nos. 3, 4, 5, 6, and 7 to Bulletin No. 19, issued on July 18, August 20, September 19, October 19, and November 22, 1910; Bulletin No. 20, issued April, 1911; and Supplements Nos. 1 and 2 to Bulletin No. 20, issued on May 23 and June 19, 1911, respectively.

Supplements Nos. 3 to 7, Bulletin No. 19, covered all reported changes of interest to navigators arising between July 1 and November 22, 1910. As occasion arises, small maps showing locations of new shoals, changes in important channels, harbors not otherwise charted, etc., are inserted in the bulletins and supplements. Supplement No. 3 contained an inset chart of Lake Superior showing magnetic variations at various places over the lake surface and on the shore, based on the results of observations over the lake surface made between 1902 and 1906, and observations on land mostly made since 1902, and reduced to the year 1910. Supplement No. 7 contained an inset chart showing new shoals in Potagannissing Bay and Detour Passage, based on examinations made by the Lake Survey in August and October, 1910.

Bulletin No. 20, thoroughly revised and giving the latest information obtainable as to channels, harbors, obstructions, and other matters of interest to navigators over the entire lakes and connecting waters, was issued late in April, 1911. In this bulletin a radical departure was made from the arrangement of text appearing in previous bulletins. When the series of bulletins was started, the descriptions consisted of disconnected descriptions of various localities, principally harbors, arranged in alphabetical order for each lake. From year to year the bulletin has been amplified by the addition of descriptions giving in connected geographical sequence the important details of shoals, islands, wrecks, etc., pertaining to the coast lines intervening between harbors. These connected descriptions have, however, been given in a text division apart from the alphabetically arranged harbor descriptions. The series of coast-line descriptions of the five lakes having been completed with that of Lake Ontario, inserted in Bulletin No. 19, the consolidation of the text by incorporating the harbor descriptions in their proper geographical order in the coast descriptions was carried out in preparing Bulletin No. 20. This eliminates the undesirable feature which, under the alphabetical arrangement, resulted in scattering through different parts of the book numerous local descriptions having a close physical relation to the coast-line text as well as to each other.

Supplements Nos. 1 and 2, Bulletin No. 20, issued prior to the close of the fiscal year, covered all changes received to June 15.

The present edition of the publications is 2,600 copies, and they are supplied to all the important interests engaged in the navigation of the lakes, as well as various commercial and industrial concerns and individuals with related activities. The mailing list is carefully revised each year to the end that all proper requests may be cared for, while unnecessary and expensive duplication is avoided.

In connection with the information service of the Lake Survey and in addition to the monthly supplements of the year, the practice has been continued of issuing mimeographed special notices to important lake navigation interests and to all daily newspapers published upon the Great Lakes. These notices place in the hands of those concerned the earliest possible information relating to improvements and obstructions to navigation, lake levels, etc. The Lake Survey acts as a clearing house for information of this character, which is received from the various district engineers upon the lakes and from private sources and is promptly published. The value and necessity of the service are unquestioned.

Surveys.—Owing to shortage in the available funds, only two parties were in the field at the beginning of the fiscal year.

The first party, under the immediate charge of Assistant Engineer M. S. MacDiarmid, on the steamer *Surveyor*, was employed July 1, 1910, upon the harbor survey at Cleveland, Ohio. From the experience of the previous season it was considered expedient to complete the exposed portions of this survey during favorable midseason weather, leaving the sounding of the harbor and the topography until the fall storms made open-lake work unprofitable. Accordingly, particular attention was paid at this time to the outside hydrography. For control of the survey a system of triangulation was based on the three positions, New England Building, Case School, and St. Peters Catholic Church, originally located by the Coast and Geodetic Survey and published to standard datum in the Chief of Engineers report for 1902. Eleven new stations were established and the positions of the six entrance lights, the old and new waterworks cribs, the Cleveland Illuminating Co.'s stack, the waterworks stack at Forty-ninth Street NE. and the Otis Steel Co.'s tallest stack, were determined. Angles were observed with 10 second repeating transits and all except two of the triangles were closed within five seconds. An area 3½ miles wide and 7 miles long, extending from abreast the eastern limits of Gordon Park to One hundred and twelfth Street NW. was sounded and swept. Two obstructions were discovered, both on the line of the tunnel from the waterworks pumping station to the new crib, one having a minimum depth of 23.5 feet and the other 20.2 feet below standard low-water plane.

This survey was temporarily suspended on July 18, the party being ordered to other work. After its return on November 5, the party completed the topography along the lake front from the eastern limits of Gordon Park to the eastern boundary of Edgewater Park and up the river to Columbia Road joining the previous season's work. Detail sounding of the river and of a considerable portion of the inner harbor was also finished. Owing to exceedingly unfavorable weather, the expected completion of the Cleveland Harbor survey before the close of navigation was impossible, and on December 3 field work was discontinued and the party returned to Detroit.

Upon the suspension of operations at Cleveland in July, this party resumed the hydrographic survey in the west end of Lake Erie, continuing investigations in the South Passage from South Shoal gas buoy easterly to a line extending from Marblehead Light to the southern point of Kelleys Island. An area of 17½ square miles was swept. Two additional positions were located from the triangulation for the purpose of control, one on the dock at Lakeside, and one on the southern point of Kelleys Island, the latter known as "Kelleys, 1910." The topography of North and Middle Bass Islands was completed, shore line traverses were run along the southern shore of Kelleys Island and on the mainland from Marblehead Light to Lakeside, and inshore soundings were taken on the shoal at the southwest point of North Bass Island and in the bay opposite Put-in-Bay. The investigation of the important and critical navigable areas in the west end of the lake now being considered complete, further work in this region was indefinitely postponed, and the party proceeded to Buffalo, N. Y., there to undertake the project contemplating a resurvey of the eastern end of Lake Erie, east of Point Abino and Sturgeon Point and including the Niagara River above the Falls. For the lake work, a system of auxiliary triangulation was found necessary for control, the only available stations of the old system being Sturgeon Point, Hamburg, Buffalo Main Light, and City Hall

Tower. Stations were established at Point Abino and midway between △ Hamburg and Sturgeon Point, and several points have been located along the Canadian shore. An area of 47 square miles in the open lake west of Seneca Shoal was swept and sounded and the topography was completed along the south shore from Hamburg to the head of the river, a distance of about 11 miles. A traverse was also extended up Buffalo Creek and the City Ship Canal. The results of this survey, while not disclosing obstructions to navigation, are important in affording data for revised charts of this important region which has not been surveyed since 1875. Work was suspended on the east end of the lake on November 3, and the party finished the season at Cleveland, Ohio, as previously noted.

The hydraulic party, at the beginning of the year, was stationed at Port Huron, Mich., in charge of Junior Engineer Sherman Moore, who, upon July 4, was assigned to the charge of the Lake Michigan hydrographic party, and was succeeded on the river work by Junior Engineer W. S. Richmond. The party continued discharge and slope measurements in St. Clair River throughout the season. Special efforts were made to make this an exhaustive investigation of present hydraulic conditions in this river and to attain superior accuracy in this class of work. In addition to measurements of discharge at sections Dry Dock and Gorge, the flow through the six outflow channels at the mouth of the river was observed at monthly intervals to determine whether there was any marked interruption to the flow through any of these channels by the aquatic vegetable growth that is prevalent in the delta during midseason. Eleven automatic gauges, located at various points along the river, were maintained throughout the season and were checked by semiweekly inspections, and the references for each were connected by levels with the permanent bench marks three times during the year. Meters were rated monthly on still-water bases and were tested daily by comparative runs in the current. During weather unfavorable for hydraulic work, the party was employed on triangulation and topography in the upper river. A summary of the season's work includes 149 discharge measurements at section Gorge and 44 at section Dry Dock, about 20 separate determinations of flow and 5 sets of vertical curves at each of the six hydraulic sections in the channels of the delta, continuous records from 11 automatic gauges, 6 still-water ratings of the current meters on both heavy and light leads, several miles of duplicate wye levels, hydraulic data from several special tests, triangulation from Lake Huron to section Dry Dock, and 1 square mile of topography including 12 miles of shore line. The immense volume of data has been reduced and tabulated and the results are highly satisfactory. A few relations of gauge heights have been derived and the observed discharges have been compared graphically with former values, both indicating an increase of about 3 per cent in the volume of flow through the St. Clair River at mean stage since the determinations of 1899–1901. This change is attributed to the effect of recent dredging in the upper river. A complete analysis of slopes, and a redetermination of the discharge formula for this river are now possible, and will be made during the coming year. The results will be highly valuable in the study of many important problems involving lake levels and the hydraulics of the interflow rivers.

The continuation of surveys in the south end of Lake Michigan for the season of 1910 was assigned to the immediate charge of Junior Engineer Sherman Moore. An advance party reached Gary, Ind., by rail on July 5, and at once began the topographic survey of the city and environs. The steamer *Search*, which had previously been connected with this work, was at the shipyard at the beginning of the year, awaiting a new boiler and extensive repairs to the hull and machinery. The steamer *No. 2*, in process of reconstruction, was rushed to completion and assigned temporarily to the Lake Michigan party. The steamer left Detroit on July 14 and, after inspection of gauges en route, reached Gary on July 27. From then until October 1 the party was employed in extending the hydrography and topography easterly from the limits of the 1908 surveys to the longitude of Dune Park (about 87° 08′), 10 miles east of Gary. Seventy-eight square miles, comprising the entire water area between the 3 and 11 fathom contours within these limits, was swept to a clear depth of 35 feet. No obstructions were encountered. On days unfavorable for sweeping the party was employed in topography, which, including the city of Gary, covered 17 square miles. Control was based on stations of the water triangulation executed in 1908. While at Gary a staff gauge was maintained, and by comparison of readings with simultaneous water levels at Milwaukee, the elevations of the zero of gauge and the reference bench marks were determined. An exchange of steamers was made on September 1 upon arrival of the *Search* after completion of repairs. After finishing the projected work at Gary, the party was transferred to Waukegan, Ill., and from October 1 to November 11 succeeded in sweeping 17 square miles and developing the topography over an area of 4 square miles. Owing to the lateness of the season, the field work was confined to the immediate vicinity of the harbor, leaving a gap to the north of the 1909 operations for the time being. The sweeping area selected lies along the shore southerly from Waukegan. Many uncharted shoal spots were found, the majority of which, being in close to shore, were unimportant. Notices of the more important were promptly issued to the press and duly noted in the subsequent bulletin supplements. The topography accomplished covers the territory between the Chicago & Milwaukee Electric Railroad and the lake shore, extending from Waukegan to Lake Forest. This country was exceedingly difficult, being cut up by heavily wooded ravines, and progress was consequently slow. Upon suspension of the field work in this vicinity, the party proceeded by steamer to Detroit, inspecting several of the standard gauges en route.

A fourth party, in charge of Junior Engineer Ira C. Sunderland, on the steamer *Col. J. L. Lusk*, took the field on July 2, 1910, and immediately resumed the hydrographic survey along the west shore of Lake Huron, which had progressed southward to the vicinity of Presque Isle in 1909. The general advance of this work during the season reached the vicinity of North Point and Thunder Bay Island, and during weather unfavorable for operations in the open lake a harbor survey of Alpena, Mich., including the topography of the entire city and detail soundings in the river and along the lake shore, was completed. Triangulation for control of the lake work was extended from Presque Isle to Scarecrow Island. Between Presque Isle and Thunder Bay Island the advance was made by four transfers of water triangulation and three regular triangles. Computing backward from the line △Misery-Thunder Bay Island Light as a base, the error in position of Presque Isle Light was about 2¾ meters. Adjusted positions were used for projection. The triangulation in Thunder Bay was started from the line Mac-Scarecrow Island, a secondary line of the 1905 primary work. During the season the shore-line topography was continued from Albany Point (near Presque Isle) to Partridge Point on the west side of Thunder Bay, and the hydrography, including the sounding of a belt 5 miles wide along the shore and the sweeping of all areas having depths between 21 and 50 feet, was carried to the vicinity of Thunder Bay Island. That portion of Thunder Bay lying northwest of the line between Sulphur Island and Whitefish Point was also swept. The operations of this party on Lake Huron were twice interrupted during the season by orders for special investigations of reported obstructions in Potagannissing Bay and St. Marys River. The survey in Potagannissing Bay consisted of sweeping the area northward from Surveyors and Gull Islands to Long Island, and easterly to Cedar and Propeller Islands. An uncharted shoal with 8½ feet depth of water was discovered midway between Bacon and Saltonstall Islands; and considerable lesser depths and larger areas were found on the charted shoals. The second special investigation was made in October, upon receipt of a report that an obstruction had been encountered in the channel near Watsons Reef in the lower St. Marys River. The waters along the sailing course from Frying Pan Island to abreast of Pipe Island and between Watsons Reef on the westward and Pipe Island and Pipe Island Shoal on the eastward were swept without result, except to verify the current charts. The hydrography accomplished by this party during the season covers a total area of 161 square miles, of which 61 square miles were swept. Stadia traverse for topography totaled 106 lineal miles.

The primary-triangulation party, in charge of Junior Engineer H. F. Johnson, began field work on June 30, 1910. At that time gas-pipe observing towers were standing at stations Tecumseh, Deerbrook, Maidstone, and Cottam, and wooden towers at stations Mount Clemens and Walpole. Angle observing began at △Tecumseh, on the south shore of Lake St. Clair, and six stations were occupied between then and the first week in December, advancing the system to the north shore of Lake Erie. The station-building party erected a gas-pipe tower at Mettawas (Kingsville, Ontario), and wooden towers at stations Pelee, Colchester, Middle Sister, Middle Bass, and Kelleys, and then assisted on secondary work in Lake St. Clair and at the mouth of Detroit River. The slow progress of the observing party during the season was due to extremely unfavorable weather during the summer months and to the difficulty in obtaining clear lines of sight. The work accomplished, however, was of high grade, six triangles being closed, with an average error of 0.71 second.

On December 3, 1910, the observing party was transferred to Sand Point in Saginaw Bay to undertake the measurement of the Sand Point base line. The station-building party had preceded and had about completed preparations. For the purposes of the measurement, three standardized "Invar" tapes and the accompanying apparatus had been borrowed from the United States Coast and

Geodetic Survey. Accepted methods for primary base line work were followed closely and the results were highly satisfactory, resulting in a probable error, for the length, of less than 1:2,000,000.

The project for the 1910 field season contemplated an extended series of magnetic observations on the waters of Lake Superior, to be taken from the Lake Survey steamer *No. 2*, but, owing to the assignment of this boat for the temporary use of the Lake Michigan party and the lateness of the season when it became available, the program was necessarily modified. The magnetic work was confined to that which could readily be accomplished on the trips incident to the exchange of steamers with the addition, on the down trip, of a side run to Grand Marais, Mich., and Caribou Island on Lake Superior. Assistant Engineer Thomas Russell was assigned to the charge of this work. He left Detroit with a small party aboard the steamer *Search*, August 18, reached Gary, Ind., on August 31, and with the *No. 2* returned to the Straits and made the side trip up the St. Marys River and into Lake Superior, returning to Detroit October 15. The general program of observations included frequent determinations, during each day's run, of the magnetic bearings of the sun as observed with the standard compass, and the comparison of the corrected compass bearings with the true azimuth, each observation constituting one determination of magnetic declination or variation. Locations were computed by dead reckoning. Compass errors or deviations were determined at various harbors en route by the process of swinging ship and comparing bearings by the standard compass on board with true magnetic bearings determined on shore. On days unfavorable for running, observations for declination were made ashore with the magnetometer, and the chronometer was frequently checked by stellar observations. Incidentally the correct azimuths of Winter Point and Cedar Point ranges on the St. Marys River were determined. The entire course traveled during the trip was 1,880 miles, during which 3,200 observations for declination aboard ship and nine independent determinations of deviations were made. Declinations at six harbors were observed with the magnetometer. Being the first magnetic work of this character conducted by the Lake Survey, the observations on water were largely experimental. The results attained are highly satisfactory and it is planned to continue this work systematically until the entire waters of the Great Lakes have been covered.

During the present working season five parties have taken the field.

The first party, in charge of Assistant Engineer M. S. MacDiarmid, with the steamer *Surveyor*, left Detroit May 16, proceeding directly to Cleveland, Ohio, where the harbor survey was resumed and carried to completion on May 29. Inshore soundings along the lake shore outside of the harbor and the topography from the easterly limits of Edgewater Park west to One hundred and seventeenth Street NW. were the principal works accomplished. From Cleveland the party proceeded to Buffalo and up to the end of the year has been engaged on the continuation of hydrographic and topographic surveys at the east end of Lake Erie. The lake shore topography, one-half mile in width, has been extended southwesterly from Hamburg to Eighteen Mile Creek, and from the new waterworks site in

Buffalo to Squaw Island, and an area of about 2 square miles to the south and east of Seneca Shoal has been swept.

The second party on the steamer *Search*, under charge of Junior Engineer Sherman Moore, took the field on May 16, 1911, to resume operations along the west shore of Lake Michigan. En route a stop was made at Naubinway, Mich., to investigate reported obstructions in the approach to that harbor. An area of about 1½ square miles, extending 2 miles southeasterly from the harbor, was swept. Uncharted shoals and corrections to depths on charted shoals were discovered as follows, depths being referred to standard low-water plane:

1. A bowlder shoal with least depth of 7.4 feet, about 500 feet long north and south by 200 feet wide, bears 41° (NE. ⅜ N.) 4,200 feet from the north end of Naubinway Island, and 119° (SE. by E. ⅜ E.) 2,300 feet from the end of the lumber dock.
2. A bowlder shoal with least depth of 15.7 feet, about 500 feet long east and west by 200 feet wide, bears 52° (NE. ⅝ E.) 5,700 feet from the north end of Naubinway Island, and 102° (ESE. ⅞ E.) from the end of the lumber dock.
3. A detached bowlder shoal with least depth of 1.7 feet, about 400 feet long east and west by 50 feet wide, bears 30° (NNE. ⅝ E.) 6,000 feet from the north end of Naubinway Island, and 67° (ENE.) 3,400 feet from the end of the lumber dock.
4. The spit off Mille Coquins Point extends out to a point 2,900 feet 20° (N. by E. ¾ E.) from the north end of Naubinway Island, and 3,400 feet 170° (S. ⅞ E.) from the end of the lumber dock, and has close to its outer end a bowlder with a least depth of 6.7 feet.

During the progress of hydrography a survey was made of the village, docks, and about 2 miles of adjacent shore line. Upon completion of the work at Naubinway the party proceeded to Waukegan, Ill., and up to July 1 had completed the sweeping of 34 square miles just southerly of the harbor, in the area upon which work was started in 1910, in addition to doing considerable sounding outside of this area. The water triangulation has also been advanced from Ravinia to Waukegan and a start was made on the topography southerly of the 1910 work.

A third hydrographic party in charge of Junior Engineer Ira C. Sunderland, with the steamer *Col. J. L. Lusk*, began field work in Thunder Bay, Lake Huron, on May 15, 1911, continuing the previous year's surveys to the southward. At the end of the year the trigonometric control had been extended to Black River Island, the offshore sounding to a line bearing N. 70° E. of South Point, the sweeping to the immediate vicinity of Sulphur Island, and the shore line topography a distance of 16 miles to South Point. The total area of hydrography completed to July 1 is 87 square miles, of which 27 square miles has been swept.

The hydraulic party, with the steamer *No. 1*, left Detroit on May 20, 1911, in charge of Junior Engineer W. S. Richmond, to begin a series of discharge measurements at the Three Points section on the St. Lawrence River. Upon arrival the old ranges were renewed and the section gauges set, and before the end of the year the section had been resounded and 32 discharge measurements made. Meters were rated before and after this series of measurements. The elevations of all gauge zeros were redetermined and a special line of levels, including an instrumental river crossing, was run at Morrisburg, Ontario, to correct an error in the precise level values determined in 1902. The discharge measurements of 1911 on the St. Lawrence River were planned to supplement those of 1908 in redetermining the relation of Lake Ontario stages and river flow which has been modified by the artificial changes in the river since the extensive series of measurements in 1900 and 1901. The projected work for the season contemplated spring and fall measurements on the standard section, and on July 1 the hydraulic party was under orders to temporarily suspend operations on the St. Lawrence and during the interval to assist Mr. MacDiarmid's party on surveys on the Niagara River.

The continuation of the primary triangulation system originating at the Straits of Mackinac and extending southward along the west shore of Lake Huron was resumed on April 14 by a party in charge of Junior Engineer H. F. Johnson. Observing was begun at station Mettawas in Kingsville, Ontario, and on June 18 the angle reading had been advanced to complete the connection on the old Lake Erie system at stations Middle Sister, Middle Bass, and Kelleys. Five stations were occupied and eight triangles closed with an average closing error of 0.58 second. The preliminary computation of the system from the Mackinaw base line, with only station and figure adjustments, checks on the line Middle Bass–Kelleys, as follows: length of side, one in 18,350 short; azimuth, 4.92 seconds small; position at Middle Bass, latitude 1.417 seconds large, longitude 1.261 seconds small. The length of the Sand Point base line computed from the Mackinaw base is one in 81,900 short. The errors in closure in azimuth and position at △ Middle Bass are unexpectedly large, but as they represent the accumulation of errors over the entire 1,200 mile loop, including a weak link on the north shore of Lake Superior, they can not be considered as measuring the accuracy of the system below Mackinaw. After the connection from Mackinaw to Green Bay, which is the next primary work proposed, the loop involving the Lake Huron system will be shortened to about 850 miles and the Lake Superior connection will be cut out. The results will then probably appear better. An auxiliary party has been employed since the beginning of the season in assisting with a connection from the primary to the old secondary triangulation system at the mouth of Detroit River and in establishing an entirely new secondary system on Lake St. Clair. The latter work was well advanced at the end of the year, having been completed from the mouth of Bassett Channel around the east and south shores to Huron Point on the west shore. Angles have been observed at 17 stations, 1 church, and 3 lighthouses, closing 26 triangles.

Preliminary work on the project for surveying and charting the natural navigable waters of the New York canals, as provided for in the act of Congress approved March 4, 1911, has been started by the Lake Survey, steps having been taken to assemble the detail charts and data of all pertinent Government and State surveys. The approved project contemplates the publication of charts and bulletins covering the portions of the canal included in the meaning of the act, so soon as sufficient data are available. It is proposed to supplement existing data with such field surveys and reconnoissance as are found necessary, and this work will be taken up during the coming year as rapidly as available funds will allow.

Water levels.—The stage of water in the lakes and in the interlake and outflow rivers has been recorded as heretofore by the regular series of self-registering gauges. The gauge at Dry Dock, Port Huron, was discontinued at the end of the 1910 field season of the St. Clair River discharge party, and will not be reestablished permanently. The gauge house at Milwaukee, Wis., was moved in August, 1910, from the outer end of the old south pier to a similar position on the new concrete pier at the entrance to the river, and the automatic gauge was installed in a specially constructed well in the outer caisson. The gauge house is lower and nearer the end of the pier than formerly, and consequently in its new position became more exposed to the seas. To guard against damage from ice and wave action a permanent reinforced protection wall was constructed in November around the outer face and the two sides of the house to a height of about 6 feet. The Milwaukee gauge is now in excellent shape.

Including the St. Clair Flats gauge, which is maintained by the United States engineer office under charge of Col. C. McD. Townsend, Corps of Engineers, during the season of navigation, and by this office during the winter, the Lake Survey now maintains 10 self-registering and 1 staff gauge, as follows:

1. Lake Ontario, at Tibbetts Point.
2. Lake Erie, at Buffalo.
3. Lake Erie, at Cleveland.
4. Detroit River, at Fort Wayne.
5. Lake St. Clair, at Windmill Point (staff).
6. St. Clair River, at head of St. Clair Flats Canal.
7. St. Clair River, at Port Huron.
8. Lake Huron, at Harbor Beach.
9. Straits of Mackinac, at Mackinaw City.
10. Lake Michigan, at Milwaukee.
11. Lake Superior, at Marquette.

In addition, this office received records of the self-registering gauges maintained by the district offices, as follows: Detroit River at Amherstburg, Lake Michigan at Chicago, St. Marys River below the locks, and St. Marys River above the locks, and records of staff gauge readings on Lake Ontario at Oswego and on Lake Superior at Houghton and Duluth.

The zeros of all gauges maintained by the survey have been carefully checked during the past year and the instruments overhauled. The records are for the most part excellent.

Monthly means of water level for stations named, expressed in feet above mean tide at New York.

[Adjusted levels of 1903.]

	1910						1911					
	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.
Marquette	601. 88	601. 97	601. 96	601. 92	601. 68	601. 41	601. 07	600. 92	600. 69	600. 57	600. 87	601. 33
Milwaukee	580. 49	580. 31	580. 29	580. 10	579. 78	579. 46	579. 20	579. 40	579. 23	579. 45	579. 74	580. 01
Harbor Beach	580. 42	580. 33	580. 20	580. 08	579. 83	579. 52	579. 38	579. 35	579. 35	579. 37	579. 66	579. 98
Cleveland	572. 40	572. 22	572. 02	571. 88	571. 46	571. 34	571. 04	571. 09	571. 08	571. 61	571. 88	571. 94
Oswego	246. 29	246. 05	245. 70	245. 38	245. 15	244. 89	244. 77	244. 86	244. 96	245. 44	245. 60	245. 66

There is herewith a sheet showing the monthly mean water leve
of all the Great Lakes from January, 1860, to June, 1911, inclusiv

During the year there has been issued a series of notices to nav
gation interests giving the monthly mean stages for all the lak
during the preceding month, comparing these stages with corr
sponding ones for critical years, and predicting the stages to
expected for the following month. These notices have been accept
as authoritative and of great usefulness.

Investigation of lake levels.—The taking of air and water temp
atures was continued during the season by the steamer part
engaged on hydrographic and magnetic work.

The study of river flow and the related subject of lake levels h
received particular attention during the year. The following ta
gives a summary of discharges by the present accepted formu
corresponding to the mean elevations of the various lakes for t
last 51 years:

Table of mean discharges.

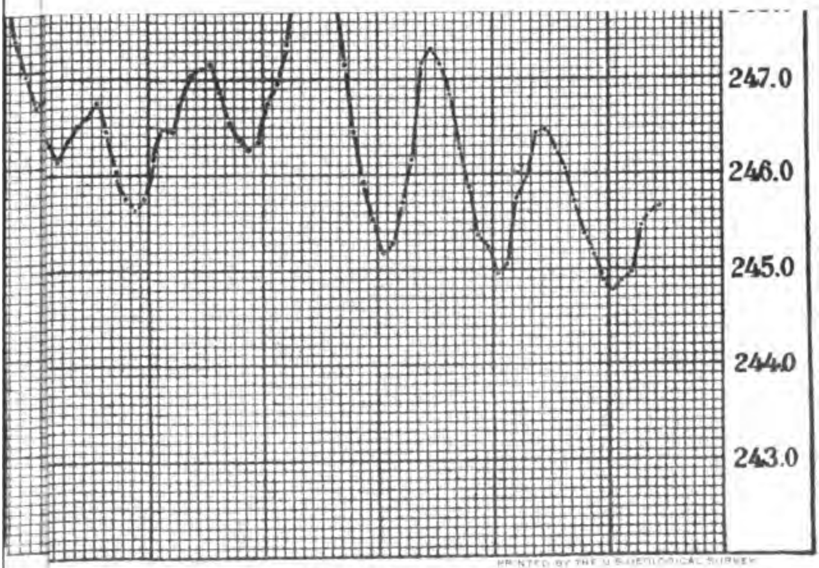
Mean elevation for 51 years (1860–1910) above mean tide at New York City, in feet.		Corresponding mean disch in cubic feet of water second.[1]	
Lake.	Stage.	River.	Disch
Superior	602.29	St. Marys	5
Michigan-Huron	581.28	St. Clair	21
St. Clair at Flats Canal	575.69	Detroit	21
Erie	572.58	Niagara	21
Ontario	246.20	St. Lawrence	24

[1] The volumes of discharge are for open-season flow and for such conditions of outflow as existed i
year 1910. They do not include the flow in the power canals in St. Marys River, nor that in the Ch
Drainage Canal, nor the flow from Lake Erie through the Welland and Erie Canals.

Plant.—The floating plant of the survey consists of five sm
steamers, three of which are equipped with launches for use
sweeping operations. None of the steamers was originally b
for survey work, but by alterations and improvements from t
to time all have been made fairly serviceable. As usual with
floating plant, however, the repair bills are annually increasing,
some of the steamers are now in need of general repairs. Du
the past year the *Search* has been equipped with a new water-t
boiler and has had considerable repair work done on the hull
machinery. The *Surveyor* was docked at the end of the 1910 f
season for the purpose of recalking, and the steamer *Col. J. L. D*
received extensive repairs to decking, planking, and bulwarks.
small launch in use by the steamer *Search* party (No. 7) was enti
rebuilt, and the entire floating plant has received minor rep
necessary to maintenance.

Estimate.—The season for survey work on the Great Lakes at
utmost extends from May 15 to November 15, a period of six mon
of which the opening and the closing two weeks are usually c
acterized by rough seas and windy weather. To use the s
period available for profitable work in the open lakes to the hig
possible advantage requires ample funds and an efficient equipm

The increased demand for charts issued by this office has ne
sitated a marked increase in the operations of the drafting



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engraving department, and the extension of the jurisdiction of the Lake Survey to include the New York canals will involve additional expense. To provide for these and to continue the profitable use of the equipment and floating plant in prosecuting the field work on the lakes with the usual vigor, it is estimated that $150,000 may be profitably expended during the year ending June 30, 1913, and it is recommended that this amount be appropriated and that the appropriation be formulated as follows:

For survey of northern and northwestern lakes, and of the lakes and other natural navigable waters embraced in the navigation system of the "New York canals," including all necessary expenses for preparing, correcting, extending, printing, and issuing charts and bulletins, and of investigating lake levels with a view to their regulation, to be immediately available, one hundred and fifty thousand dollars.

Dates and amounts of appropriations for surveys of Northern and Northwestern Lakes.

Mar. 3, 1841	$15,000
May 18, 1842	20,000
Mar. 1, 1843	30,000
June 17, 1844	20,000
Mar. 3, 1845	20,000
Aug. 8, 1846	25,000
Aug. 12, 1848	25,000
Mar. 3, 1849	10,000
Sept. 28, 1850	25,000
Mar. 3, 1851	25,000
Aug. 30, 1852	25,000
Mar. 3, 1853	50,000
Aug. 5, 1854	50,000
Mar. 3, 1855	50,000
Aug. 30, 1856	50,000
Mar. 3, 1857	50,000
June 12, 1858	75,000
Mar. 3, 1859	75,000
June 21, 1860	75,000
Mar. 2, 1861	75,000
July 5, 1862	105,000
Feb. 9, 1863	106,879
July 2, 1864	100,000
Feb. 28, 1865	125,000
June 12, 1866	50,000
Mar. 2, 1867	77,500
Mar. 2, 1868	$77,500
July 20, 1868	75,000
Mar. 3, 1869	100,000
July 15, 1870	100,000
Mar. 3, 1871	175,000
June 10, 1872	175,000
Mar. 3, 1873	175,000
June 23, 1874	175,000
Mar. 3, 1875	150,000
July 31, 1876 (not including $16,000 applied to survey of Mississippi River)	84,000
Mar. 3, 1877 (not including $25,000 applied to survey of Mississippi River and including $9,500 received from sale of steamers)	94,500
June 20, 1878 (not including $49,500 applied to survey of Mississippi River)	49,500
Mar. 3, 1879	85,000
June 16, 1880	40,000
Mar. 3, 1881	18,000
Aug. 7, 1882	12,000
Total	2,939,879

Printing and issue of charts for use of navigators and electrotyping copperplates for chart printing.

Mar. 3, 1883	$3,000
July 7, 1884	3,000
Mar. 3, 1885	3,000
Aug. 4, 1886	2,000
Mar. 3, 1887	2,000
Oct. 2, 1888	2,000
Mar. 2, 1889	2,000
Aug. 30, 1890	2,000
Mar. 3, 1891	2,000
Aug. 5, 1892	2,000
Mar. 3, 1893	$2,000
Aug. 18, 1894	2,000
Mar. 2, 1895	2,000
June 11, 1896	2,000
June 4, 1897	2,000
July 1, 1898	3,000
Mar. 3, 1899	3,000
June 6, 1900	3,000
Total	42,000

Surveys and additions to and correcting engraved plates.

Mar. 2, 1889	$5,000
Aug. 30, 1890	10,000
Mar. 3, 1891	10,000
Aug. 5, 1892	5,000
Mar. 3, 1893	25,000
Aug. 18, 1894	25,000
Mar. 2, 1895	25,000
June 11, 1896	$25,000
June 4, 1897	25,000
July 1, 1898	25,000
Mar. 3, 1899	25,000
June 6, 1900	75,000
Total	280,000

Surveys, including investigations of lake levels, correcting, printing, and issuing charts and bulletins.

Mar. 3, 1901	$100,000
June 28, 1902	150,000
Mar. 3, 1903	150,000
April 28, 1904	150,000
Mar. 3, 1905	100,000
June 30, 1906	75,000
Mar. 4, 1907	$75,000
May 27, 1908	125,000
Mar. 4, 1909	125,000
June 25, 1910	125,000
Mar. 4, 1911	125,000
Total	1,300,000

F F F 2.

PRESERVATION OF NIAGARA FALLS.

During the fiscal year just ended, operations under allotments to the Lake Survey from the appropriation of the act of June 29, 1906, were confined to a continuation of water level and slope observations on the Niagara River, tests of turbines in the plant of the Niagara Falls Power Co., and the supervision of power and transmission companies operating under permits from the Secretary of War.

Slopes in the Niagara River.—Automatic gauges established in the spring of 1910 at Chippawa, International Railroad Co.'s intake, Suspension Bridge, and Whirlpool, were maintained until ice conditions in the fall made their removal necessary. During the past winter the records of these gauges for 1909 and 1910 were reduced in the office, and an elaborate study was made of all Niagara River water level data obtained since 1906. It was found that the increase of diversions by the power companies at Niagara Falls and natural and artificial changes in the regimen of the river have disturbed the slope relations to some extent since previously determined. From the records of the gauges maintained in 1908, which year represents about the average conditions since 1906, relations have been established between the water levels at these stations and Lake Erie stages at Buffalo breakwater gauge. The formulas for other gauges previously maintained were reduced to 1908 conditions by known relations of fluctuations with the permanent gauges. The seasonal cycle of slope caused by the subaqueous growth of vegetation in the Chippawa-Grass Island pool during the midsummer was eliminated so far as possible. The resulting formulas for river heights at the several gauges in terms of Lake Erie stage at Buffalo for the mean conditions between July 1 and November 1, 1908, are as follows:

Austin Street.............. $=565.341+0.821^{h}$
Black Creek................ $=563.918+\ .674^{h}$
Schlossers Dock............ $=562.088+\ .640^{h}$
Willow Island.............. $=559.248+\ .422^{h}$
Wing Dam................... $=557.157+\ .375^{h}$
Chippawa................... $=561.250+\ .565^{h}$
Grass Island............... $=560.596+\ .565^{h}$
Prospect Point............. $=512.489+\ .126^{h}$
Terrapin Point............. $=506.200+\ .238^{h}$
Horseshoe.................. $=506.665+\ .580^{h}$
International R. R. intake.. $=508.720+\ .615^{h}$
Suspension Bridge.......... $=335.007+2.286^{h}$
Whirlpool.................. $=286.238+2.432^{h}$

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^{h} equals the stage of Lake Erie at Buffalo above 570 feet.

The locations of these several gauges and the periods covered by the records of each are as follows:

Austin Street gauge, on the south side of the slip of the Buffalo Smelting Works at the foot of Austin Street, Black Rock, Buffalo, N. Y., was maintained during the Niagara River discharge measurements in 1899–1901, and also during the summers of 1903 and 1907, and for a few months in the early part of 1908. Elevations depend on P. B. M. Guard Lock as 576.454 feet.

Black Creek gauge, self-registering, at Black Creek, Ontario, was maintained during the summer of 1906 only. Elevations depend on a wye level line run from Niagara Falls in 1906, and correspond to P. B. M. Niagara No. 2 as 571.827 feet.

The gauge near the northern end of Schlossers Dock, at the foot of Sugar Street, Echota, Niagara Falls, N. Y., was maintained only during June, July, and a part of August in 1908. The fractional season's record made it impossible to eliminate the effect of seasonal cycle in the above formula for this gauge. It is probable that more extended observations would have shown the coefficient and the absolute term of the formula slightly smaller. The elevations depend on P. B. M. Echota as 572.922 feet.

The self-registering gauge at Willow Island on the New York State Reservation, about 50 feet above the head of the wing dam opposite the head of Goat Island, was maintained during the latter part of the season of 1906. As the record began in August, it was not possible to fully eliminate the effect of the seasonal cycle. Elevations at this point depend on local bench marks established by a wye level line from P. B. M. Niagara No. 2.

Wing Dam gauge, located on the outside of the wing dam opposite the head of Goat Island, 170 feet from the spillway at the lower end of the dam, was maintained during the summer of 1907 and during the early part of the summer of 1908. Elevations depend on local bench marks established by wye level lines from P. B. M. Niagara No. 2.

The Chippawa self-registering gauge, located on the southeast corner of the old dock on the north side of Welland River (Chippawa Creek) near its mouth, was maintained during the summers of 1906, 1907, 1908, and 1910. Elevations depend on local bench marks set by a wye level line run in 1906 from P. B. M. Niagara No. 2.

Grass Island self-registering gauge, located on the northern end of the river face of the crib work on the northern end of Grass Island, was maintained during the summers of 1903, 1907, 1908, and 1909. The observations during 1903 were abnormal, due to the presence in the river of the Ontario Power Co. diverters, and have not been used in the deduction of the formula. The elevations here also depend on P. B. M. Niagara No. 2.

A self-registering gauge was maintained on Prospect Point, about 10 feet back from the crest of the American Falls, during parts of November and December, 1908. This short period of observations did not allow of eliminating the seasonal cycle, but owing to the small relative fluctuations at this point the effect would very likely be inappreciable. Elevations depend on local bench marks set by wye levels from P. B. M. Niagara No. 2.

In the fall of 1906 a self-registering gauge was maintained for a few weeks at Terrapin Point, on the American end of Horseshoe Falls. The gauge was fastened to the south side of the iron railing around Terrapin Rock and was in very shallow water. The relative fluctuation determined probably applies only to the single point at which the gauge was located.

The so-called Horseshoe gauge, located about 100 feet above the crest of the Horseshoe Falls on the Canadian side, was maintained during the summer of 1908. Owing to the shallow water at this point, the gauge was reestablished in 1909 at the entrance to the International Railroad Co. intake canal, it being secured to the downstream side of a square concrete post at the end of the retaining wall on the lower side of the canal. The gauge was maintained in the new position during the seasons of 1909 and 1910 and is known as the International Railroad intake gauge. Elevations depend on local bench marks established by wye levels from P. B. M. Niagara No. 2.

Suspension Bridge gauge was located on the northern face of a large flat-topped bowlder on the United States side of the Niagara River, about 415 feet above the Michigan Central cantilever bridge at Suspension Bridge, N. Y. A self-registering gauge was maintained during the summer seasons in the years 1906 to 1910, inclusive. Elevations were determined by wye levels from P. B. M. Suspension Bridge (584.377 feet) and a vertical measurement with standardized base wires.

A self-registering gauge has been maintained at the Whirlpool during the summers of 1906 to 1910, inclusive. This gauge was located on the Canadian side of the Whirlpool, on the river side of an outcropping ledge of limestone, with its top ordinarily some 3 or 4 feet above the water surface. Elevations depend on local bench marks established by means of a wye level line from the local bench marks at Suspension Bridge down the tracks of the Gorge Route on the United States side, and a careful river crossing.

Discharge formulas for 1908.—The discharge of the Niagara River may be expressed in terms of the heights on the crests of any of the several distinct weirs over which the river flows. The discharge over the initial weir—the rapids in the upper river—was measured in 1908 and an equation of discharge derived in terms of Lake Erie stages at Buffalo. The equation is,

$$Q=3904\ (\text{Buffalo}-558.37)^{\frac{3}{2}}.$$

While this weir is not a free overfall, the elevation of the water in the lower pool is proportional to Lake Erie elevations over an extended period and need not be considered in the equation. From this equation and the relation of river gauges in 1908, the discharge equations of other weirs were derived.

The flow over the weir formed by the first cascade is expressed in either of the two formulas,

$$Q=9194\ (\text{Chippawa}-554.68)^{\frac{3}{2}}$$

or

$$Q=9194\ (\text{Grass Island}-554.03)^{\frac{3}{2}}.$$

The flow over the weir formed by the Whirlpool Rapids is measured by the elevation of the water surface at Suspension Bridge gauge and the equation is,

$$Q = 1130.5\ (\text{Suspension Bridge} - 308.44)^{\frac{3}{2}}.$$

The flow over the weir formed by the Lower Rapids is measured by the elevation of the water surface at the Whirlpool gauge and the equation is,

$$Q = 1027.4\ (\text{Whirlpool} - 257.91)^{\frac{3}{2}}.$$

The increments of flow for 1 foot of rise above mean stage at the gauges measuring these four weirs are about 22,200, 38,900, 9,600, and 9,050 cubic feet per second, respectively.

Changes of river heights, 1906 to 1910.—From the analysis of water-level data in connection with the available information regarding diversions of water from the Niagara River, changes in river heights from 1906 to 1910, referred to mean lake stage at Buffalo, and the effects at these points due to increased diversions have been derived as indicated in Table 1.

TABLE 1.—*Changes in Niagara River heights, 1906 to 1910.*

Gauge.	Observed changes.	Effect of increased diversion.	Effect of change of regimen.
a	*b*	*c*	*d*
Chippawa	−0.06	−0.12	+0.06
International R. R. intake	−1.69	− .30	−1.39
Horseshoe Falls	− .79	− .29	− .50
Terrapin Point	− .13	− .12	− .01
Suspension Bridge	− .18	+ .05	− .23
Whirlpool	− .18	+ .05	− .23

Quantities in column *c* are derived from the estimated increase of diversions above and below the first cascade combined with the equations of discharge referred to the several gauges.

Quantities in column *d* are the residuals or differences between columns *b* and *c*, and show the effects of artificial and natural changes of regimen in the river, and include, also, errors of observation and reduction. The principal changes in regimen are the establishment of a dumping ground for dredged material between Strawberry and Grand Islands in the upper river, the extensive breaking away of the crest line in the Horseshoe Falls, and the gradual erosion of the rapids.

Summary.—A summary of the results of the recent comprehensive analysis of Niagara River slopes, conducted by Junior Engineer Sherman Moore, is shown in Table 2, extracted from his special report recently submitted.

TABLE 2.—*United States Lake Survey, Preservation of Niagara Falls—Simultaneous gauge heights and miscellaneous factors.*

	Elevation of Lake Erie at Buffalo.	Discharge of Niagara River.	Elevation of Niagara River at—													
			Austin Street.	Black Creek.	Schlossers Dock.	Chippawa.	Grass Island.	Willow Island.	Wing Dam.	Prospect Point.	International R. R. intake.	Horseshoe Falls.	Terrapin Point.	Suspension Bridge.	Whirlpool.
For river conditions as existing in the year 1908.	*a*	*b*	*c*	*d*	*e*	*f*	*g*	*h*	*i*	*k*	*l*	*m*	*n*	*o*	*p*
	574.00	241,200	568.62	566.61	564.65	563.51	562.86	560.94	558.66	512.99	511.19	508.98	507.15	344.15	295.97
	573.50	229,800	568.21	566.28	564.33	563.23	562.57	560.72	558.47	512.93	510.88	508.70	507.03	343.01	294.75
	573.00	218,500	567.80	565.94	564.01	562.94	562.29	560.51	558.28	512.87	510.58	508.40	506.92	341.86	293.53
	572.50	207,400	567.39	565.60	563.69	562.66	562.01	560.30	558.09	512.80	510.27	508.12	506.80	340.72	292.32
	572.00	196,400	566.98	565.27	563.37	562.38	561.73	560.09	557.91	512.74	509.96	507.82	506.68	339.58	291.10
	571.50	185,700	566.57	564.93	563.05	562.10	561.44	559.88	557.72	512.68	509.65	507.54	506.56	338.44	289.84
	571.00	175,200	566.16	564.59	562.73	561.82	561.16	559.67	557.53	512.62	509.34	507.24	506.44	337.29	288.67
	570.50	164,900	565.75	564.26	562.41	561.53	560.88	559.46	557.34	512.55	509.03	506.96	506.32	336.15	287.45
	570.00	154,800	565.34	563.92	562.09	561.25	560.60	559.25	557.16	512.49	508.72	506.66	506.20	335.01	286.24
Change for change of 1 foot at Buffalo	1.000	[1] 22,010	0.821	0.674	0.640	0.565	0.565	0.422	0.375	0.126	1908..... [3] 0.615 1909..... 0.626 1910..... 0.682	0.580	0.238	2.286	2.432
Correction to reduce to year 1910	....	[1]—1,700	[2]+0.08	[2]—0.01	[2]—0.09	—0.12	—0.12	[2]—0.10	[2]—0.08	[2]—0.03	[3]— 1.09 0.067h	[2]—0.38	[2]—0.06	—0.10	—0.20
Years in which observations were made	1906-1910	1907-1908	1907 1908	1906	1908	1906 1907 1908 1910	1907 1908 1909	1906	1907-1908	1906	1909-1910	1908	1906	1906-1910	1906-1910

Observed differences from year 1908.	1906		[1]+ 400		-0.02		-0.06		-0.04		-0.01	[1]+0.77		+0.07	+0.08	-0.02
	1907		+1,000	-0.11			-0.05	-0.12		-0.07		[1]+0.70			+0.06	+0.14
	1908		000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1909		-1,100					-0.17				[1]-0.71			-0.03	-0.18
	1910		-1,700				-0.12					[1]-0.92			-0.10	-0.20
Effect of diversion of 10,000 c. f. s.[1]																
From Lake Erie		-0.45	-10,000	-0.37	-0.31	-0.29	-0.26	-0.26	-0.20	-0.17	-0.06	-0.30	-0.27	-0.11	-1.04	-1.10
From Niagara River—																
Above first cascade		-0.045	+ 1,000	-0.05	-0.08	-0.12	-0.26	[3]-0.26	[3]-0.20	[3]-0.17	[3]-0.06	-0.30	-0.27	-0.11	+0.10	+0.11
Below first cascade		0.000	000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.31	-0.28	-0.11	0.00	0.00

[1] At mean stage.

[2] Estimated.

[3] Variable, depending upon point of diversion.

h=Buffalo gauge—570.

Tests of turbines, Niagara Falls Power Co.—The Niagara Falls Power Co. in the fall of 1910 completed the remodeling of generating unit No. 10 in its power house No. 1 by the substitution of a new turbine and the addition of a draft tube. Upon the representation of the company that by the increased mechanical efficiency of this unit it was entitled to a modification of the limits of power development then prescribed, Principal Assistant Engineer Ray, of this office, was instructed to be present at the tests, and to carefully inspect the improvements. During these tests, measurements of flow in the penstock of unit No. 10, for various loads on the generator were accompanied by simultaneous observations of valve openings, of piezometer readings, and of water levels in the intake canal and in the wheel pit. The discharge was measured with a Pitot tube, which was rated on a still water base just previous and subsequent to the tests. For the sake of comparison similar tests were conducted on unit No. 9 in the same power house.

An independent set of notes was taken and later reduced in the Lake Survey office. The results were not entirely consistent, and upon investigation it was found that the Pitot tube used was imperfect. The tests appeared to prove conclusively, however, that the remodeled unit was fully equal in efficiency to the units in power house No. 2. As further tests would require extensive preparations impossible to complete before the formation of ice in the canal, a tentative revision of the table of limiting output was issued for the guidance of the company. This table, based on the assumption that unit No. 10 in power house No. 1 was equivalent in efficiency to the units in power house No. 2, was made supplementary to the table previously used and became effective November 3, 1910. In consideration of the possible expiration of the Burton Act on June 29, 1911, no further tests were demanded in the spring, and the revised table was continued in use until the lapse of the permits issued under this act.

Supervision of power and transmission companies.—The supervision of the operations of power and transmission companies under their permits, which are briefly summarized on page 895 of the report of the Chief of Engineers for 1908, has been continued by the Lake Survey office during the fiscal year up to June 29, 1911, on which date the act under which the permits were issued expired by limitation. An employee stationed at Niagara Falls, N. Y., has submitted weekly reports of frequent inspections of the several power plants, and brief summaries of these reports have been duly forwarded to the Chief of Engineers. Insofar as the inspections disclose, there have been no violations of the permits. Due appreciation is expressed for the courtesy and apparent willingness with which the officers of all the companies have acceded to every suggestion or request.

To defray the expenses of operations by the Lake Survey under the act of June 29, 1906, an additional allotment of $2,000 was made by the Chief of Engineers on January 20, 1911.

APPENDIX G G G.

IMPROVEMENT OF YELLOWSTONE NATIONAL PARK, INCLUDING THE CONSTRUCTION, REPAIR, AND MAINTENANCE OF ROADS AND BRIDGES.

REPORT OF CAPT. CLARENCE H. KNIGHT, CORPS OF ENGINEERS, OFFICER IN CHARGE, FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

UNITED STATES ENGINEER OFFICE,
Yellowstone Park, Wyo., July 12, 1911.

SIR: I have the honor to forward herewith my annual report for the fiscal year ending June 30, 1911, for the improvement of Yellowstone National Park.

Very respectfully,
C. H. KNIGHT,
Captain, Corps of Engineers.

The CHIEF OF ENGINEERS, UNITED STATES ARMY.

The work during the last fiscal year ending June 30, 1911, was executed under the appropriations of June 25, 1910, and March 4, 1911, and consisted of maintenance and repair of the roads and bridges already built, together with a few minor improvements.

GARDINER ENTRANCE.

The trees, shrubs, vines, and lawns about the entrance were maintained throughout the tourist season, and with the advent of winter were protected from the severe weather where necessary.

MAMMOTH HOT SPRINGS.

The maintenance of lawns and shrubbery was continued throughout the summer, and all the trees and shrubs liable to winterkill or to injury by game or stray stock were protected by suitable tree guards and movable wire fences upon the approach of winter.

PLANT.

All sprinkling wagons in the park, together with the graders, wagons, tools, etc., were thoroughly inspected and the necessary repairs made. Such tools and implements as were necessary to replace those worn out in the service were purchased.

SPRINKLING.

The length of road sprinkled at present is approximately 85 miles. Improvements in the plant are being made continually. As fast as the available funds permit, additional gravity tanks for filling the sprinklers are being installed.

An estimate was made at the close of the season of 1909 for the extension of the sprinkling system from the Gibbon River to the Firehole River, on the Norris-Fountain Road; also from the west boundary to the main belt line via the two branch roads up the Gibbon and Firehole Rivers, in all over 29 miles of road. Traffic over the west road has increased enormously since the Oregon Short Line extended its terminus to the park boundary, and tourists who enter by this approach should be given the same comforts in the way of sprinkled roads as those who enter by the Northern Pacific approach. Three sprinkling wagons were used on this road during the last year, but the service can not be made efficient until proper tanks can be constructed.

BRIDGES AND CULVERTS.

During the season of 1910, after June 30, numerous minor repairs were made to the bridges throughout the park. It was necessary to replace many of the small wooden bridges with new bridges of cut poles. Iron bridges were painted, and redecking done wherever necessary.

A bridge was constructed over Pacific Creek in July and August.

A careful inspection was made of all wooden bridges on the main belt line during September, 1909, and detailed plans and estimates made for new bridges wherever necessary. Many of these bridges were constructed in the early nineties and they have reached the danger stage in their lives. Four of these were replaced by steel bridges during 1910, and three will be replaced during 1911. Nine others are in dangerous condition at present, but can not be replaced owing to limited funds.

Plans and estimates for a handsome reenforced concrete bridge over the Firehole River at Riverside Geyser at the Upper Geyser Basin were drawn up during the fiscal year 1910. This is one of the most frequented points of interest in the park, and it is desirable that a bridge of esthetic design be constructed, but on account of the small amount available for construction of bridges a steel arch will be placed at this point during the present summer.

A number of washouts occurred during the melting of the snow in the spring of 1911, owing to the decay and collapse of old wooden culverts. Several hundred of these culverts should be replaced at once by culverts of vitrified pipe or reenforced concrete, but with present appropriations they can be replaced only as fast as they wash out.

RETAINING WALLS.

A concrete retaining wall, 487 feet long, was constructed during October, November, and May on the Gardiner River, about 3½ miles from Mammoth Hot Springs. This wall fixes the road at a bad point in the Gardiner-Mammoth Hot Springs road. This is the first concrete revetment wall constructed in the park. There remain about 1,000 feet of dry rubble walls along the Gardiner and Gibbon Rivers in bad condition at the present time; these walls should be replaced as soon as appropriations are sufficient.

GENERAL REPAIRS.

The road from the canyon over Mount Washburn to Tower Falls was opened and repaired during July by a party of about 15 men and 4 teams.

The main and side roads in the Upper Basin were repaired and partly resurfaced in July by a small party.

The east approach road in the park and through the forest reserve was extensively repaired by a party of about 40 men with 5 to 7 teams between the middle of July and October 19.

The south road, from the Thumb through the forest reserve, was repaired during July, August, and September by two parties of from 10 to 21 men and 4 to 6 teams each.

A trail from Snow Pass to the western boundary of the park in Gallatin Valley was opened between July 6 and 19 by 13 men with 10 pack animals, and the Lamar River trail was repaired during the same month.

The road from Gardiner to the Grand Canyon was used continuously through the winter for hauling supplies to the New Canyon Hotel. This heavy traffic cut the road up badly and necessitated extensive repairs. Work on the road from Mammoth Hot Springs to Gardiner began in April. During the spring the entire road from Gardiner to Norris was regraded and 21 miles was graveled.

The road from Norris to the Grand Canyon was completely graded during June, a number of culverts and one bridge being repaired and numerous washouts refilled.

The roads between Norris and the Upper Basin and from the Grand Canyon to the Lake Hotel were graded and partly regraveled.

Between the Thumb lunch station and the Upper Basin, a distance of 19 miles, the road was not clear of snow until June 22, although the first party managed to cross the divide on June 18. Previous to that time a number of impassable washouts were repaired and one 25-foot log bridge constructed. This portion of the road was partly graveled and graded during the latter part of June.

From Yellowstone station, the west entrance of the park, to Wylie lunch station on the Gibbon River (18 miles) the road was graded and partly regraveled and several hundred feet of the narrow road widened.

A party of 1 overseer, 11 laborers, and 3 teams were at work during June on the East (Cody) Road in the Shoshone National Forest, clearing the road of slides and fallen trees and repairing washouts, bridges, and culverts.

The construction of about 1,800 feet of new road, to connect the old road with the New Canyon Hotel and with the Mount Washburn Road, was practically completed at the end of June.

Slight repairs to the Cooke City Road were made during May.

The Bunsen Peak and other side roads were opened before the beginning of the tourist season.

OPENING OF THE ROADS.

The tourist season of 1911 opened June 15. The main belt line was naturally free from snow except on the Continental Divide, which was open for traffic on June 19, the tourist coaches being delayed one day in crossing.

LIVE STOCK.

Steps were taken at the close of the tourist season of 1909 looking toward the gradual accumulation by the department of its own animals for work in the park. It is thought a considerable saving can be effected in this way and the department rendered free from the uncertainties incident upon hiring stock in sparsely settled country. Several teams for inspection and express purposes have been purchased and other animals will be purchased as funds permit.

APPENDIX H H H.

ROAD INTO MOUNT RAINIER NATIONAL PARK.

United States Engineer Office,
Seattle, Wash., July 18, 1911.

Sir: I have the honor to forward herewith annual report for the fiscal year ending June 30, 1911, on road into Mount Rainier National Park.

Very respectfully, your obedient servant,

C. W. Kutz,
Major, Corps of Engineers.

The Chief of Engineers, United States Army.

ROAD INTO MOUNT RAINIER NATIONAL PARK.

Condition of work on July 1, 1910:

Road open for public travel from forest reserve boundary to Narada Falls, 19.5 miles. Incomplete from Narada Falls to Camp of the Clouds, 4.5 miles.

Seventeen men and three teams under Overseer T. H. Huddleston moved to Narada Falls after finishing work removing débris which had fallen from slopes. This force was increased, as soon as snow melted from the road, to from 60 to 80 men and 7 teams.

The Narada trestle of ten 16-foot bents and two dry-wall abutments, second, third, and fourth bridges across Paradise River, and 3-bent trestle across Edith Creek completed.

Surfacing of rock slides and widening of roadbed along the Paradise River was completed.

Grading of roadbed between Paradise Valley and Camp of the Clouds completed, and an extension of one-half mile made beyond the Camp of the Clouds, but is incomplete.

The road between Narada Falls and Camp of the Clouds was opened to the public on September 1, 1910. A number of stages made regular trips between Longmire Springs and Camp of the Clouds during September.

On October 13 camp was removed to the glacier, where 267 cubic yards of rock were removed from the bridge approach and the road repaired for winter.

A small crew of laborers and two teams moved down to the park entrance and repaired and widened a section at the gate site, opened all culverts, and crowned and ditched road to the boundary.

Work ceased on November 3 on account of rain and was resumed on June 26, 1911, with a small force.

The number of tourists that visited the park last year was 7,654, and 547 automobiles entered the park by the Government road during that period.

The park regulations restrict automobiles to that part of the road below Nisqually Glacier, and it is questionable whether they can safely be permitted to go beyond this point unless the road is widened and protected on the cliff sides by a masonry guard wall.

This will require an enlargement of the existing project and an additional appropriation, both of which appear to be fully justified by the constantly increasing use that is made of the facilities already provided.

No estimate for maintenance is submitted, as it is understood to be the policy of the War Department, as well as the intent of Congress, that such maintenance as may be necessary shall be done under the Interior Department, which is charged with the care of the park as a whole.

APPENDIX I I I.

CRATER LAKE NATIONAL PARK.

United States Engineer Office,
Portland, Oreg., July 17, 1911.

Sir: I have the honor to transmit herewith annual report for the fiscal year ending June 30, 1911, pertaining to surveying, locating, and preparing plans and estimates for roads and trails in Crater Lake National Park, Oreg.

Very respectfully,
J. J. Morrow,
Major, Corps of Engineers.

The Chief of Engineers, United States Army.

CRATER LAKE NATIONAL PARK.

OPERATIONS DURING THE FISCAL YEAR, 1911.

Two survey parties were employed, under direction of Junior Engineer H. L. Gilbert. Each party consisted of 1 transitman, 1 levelman, 1 topographer, 1 draftsman, 1 rodman, 2 assistant topographers, 2 chainmen, 1 back flagman, and 1 cook. Surveys were begun August 20, 1910, and stopped October 6, on which date a heavy fall of snow made further fieldwork impossible.

The method of the survey was that of a preliminary railroad survey. Control was by azimuth checked by frequent observations of the sun. Y levels were used and bench marks set about every half mile, using United States Geological Survey datum and bench marks. The transit line was referenced at about 1-mile intervals. Topography was taken on both sides of line to develop a strip within which the final location would fall. Grades sought were maximum of 6 per cent for long distances, 8 per cent for fair distances, and 10 per cent rarely, and only for very short distances. Least radius of curvature sought was 50 feet.

In all, nearly 50 miles of preliminary lines were run. The survey of the location of road around the rim of crater was completed excepting for about 3 miles over the high cliff near Andersons Springs, and a location for a road from the present lodge of the Crater Lake Co. (on the rim of the lake at the southern side) to the south entrance of the park (toward Klamath Falls) was also completed. Suitable rock for macadam construction was discovered at several points on the south side of the lake, and discharge measurements were made of all springs and creeks within practicable reach of the road location.

In the office, after the return of the field party, all transit lines were computed and plotted to a scale of 1: 2400, the location was profiled, and preliminary estimates of completed surveys were made. The finished location was also plotted on a map of the park to scale of 1: 48000. Completion of this work was, however, postponed until the completion of the surveys during the present working season.

For the season of 1911 it is proposed to complete the fieldwork by sending a single survey party into the park shortly after July 1, to complete the location of the road encircling the lake; to locate a road from the crater to the eastern boundary of the park (toward Prineville); to locate a road to "The Pinnacles"; and to develop in more detail the face of "The Watchman." Subsequently the maps and estimates will be completed and final report made.

Acknowledgment is due the United States Geological Survey for valuable information, and for a number of copies of preliminary topographical sheets furnished before their general issue, which were very useful to the field parties.

APPROPRIATION.

Appropriated by sundry civil act, June 25, 1910	$10,000

APPENDIX J J J.

CONSTRUCTION OF BRIDGE ACROSS MISSISSIPPI RIVER AT FORT SNELLING, MINN.

The approved project will be found in the Report of the Chief of Engineers for 1911, part 1, page 1118.

The city of St. Paul having opened up the street connecting with the bridge approach the necessary grading was done and the approaches completed. Minor repairs were made to the bridge and approaches where necessary.

Statement of expenditures during the year.

Care of bridge and property	$655.37
Administration and St. Paul office expenses	100.00
Total	755.37

APPROPRIATIONS.

Mar. 4, 1907		$125,000
Mar. 4, 1909		20,000
June 25, 1910		1,200
Other funds:		
From city of St. Paul	$100,000	
From Twin City Rapid Transit Co	25,000	
		125,000
Total		271,200

APPENDIX K K K.

REMOVAL OF WRECK OF BATTLESHIP MAINE FROM HABANA HARBOR.

REPORT OF BOARD OF ENGINEER OFFICERS FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

United States Engineer Office, Maine Board,
Habana, Cuba, July 1, 1911.

Sir: I have the honor to submit herewith the annual report of the work of removing the wreck of the U. S. battleship *Maine* from the harbor of Habana.

For the board:

Very respectfully,
W. M. Black,
Colonel, Corps of Engineers,
Senior Member.

The Chief of Engineers, United States Army.

REMOVAL OF WRECK OF BATTLESHIP MAINE.

The removal of the wreck of the *Maine* from the harbor of Habana is being carried on under the acts approved May 9, 1910, June 25, 1910, and March 4, 1911, appropriating sums for the work which aggregate $650,000. The first act requires that the Secretary of War and Chief of Engineers, United States Army, provide with all convenient speed for the raising and removal of the wreck of the U. S. battleship *Maine* from the harbor of Habana and for the proper interment of the bodies therein in Arlington Cemetery, and further directs the Secretary of War to remove the mast of the wreck and to place it upon a proper foundation in Arlington National Cemetery, at or near the spot where the bodies of those who died through such wreck are interred. The first of the above-mentioned acts appropriated $100,000 for the work. On May 17, 1910, the Secretary of War transmitted to Congress a letter from the Chief of Engineers in which he states:

> 2. It seems probable that the best plan for carrying out the provisions of the act will be to construct a cofferdam around the wreck and pump it out, thus permitting the removal of the human remains and a through examination of the hull. No estimate for such a structure has been made, but it is certain that it will cost considerably more than $100,000. Until the cofferdam is completed and the hull exposed to view, no estimate, even of the most approximate nature, can be formed of what it will cost to patch the hull of the wreck sufficiently to float it or to remove the wreck piecemeal, if it can not be floated.
>
> 3. In my opinion no work of construction should be undertaken unless it can be prosecuted continuously to a conclusion, and as it is impracticable to estimate in

advance what it will cost to raise or remove the wreck, I recommend that legislation be enacted authorizing such expenditures as may be necessary, to be paid out of any money in the Treasury not otherwise appropriated. On account of rapid deterioration it would be highly inadvisable to start the work and then await further appropriations.

4. It is believed that the amount required for carrying out the provisions of the act will not be less than $500,000 and may be more.

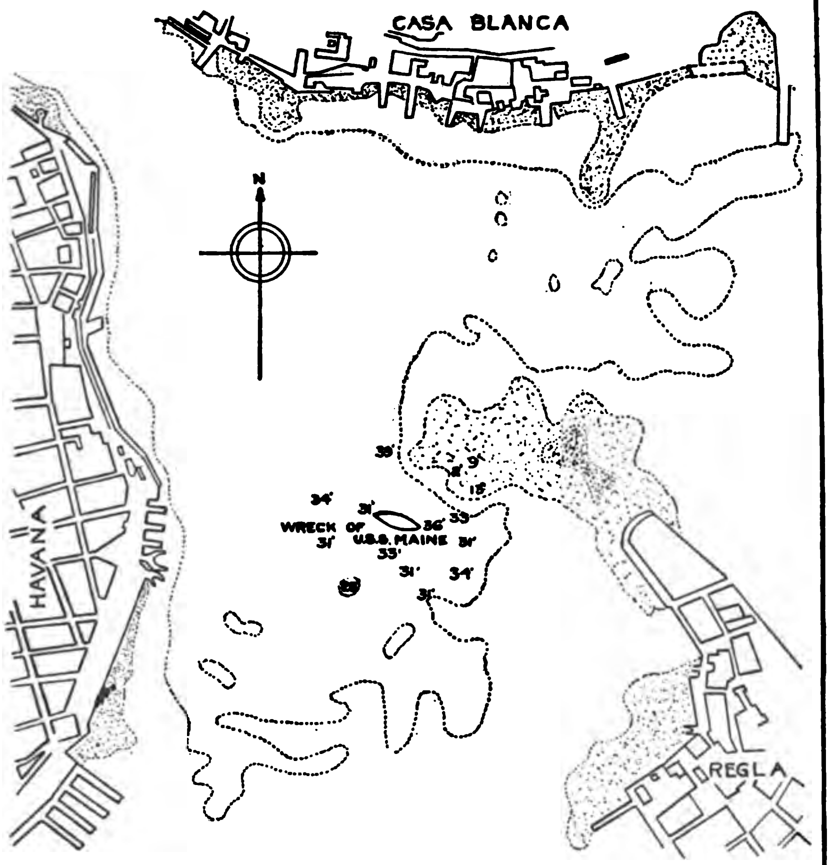
The recommendations of the Secretary of War and Chief of Engineers resulted in a further appropriation of $200,000, making $300,000 in all up to June 25, 1910, inclusive. It having become evident that the amount then available would not suffice, on January 17, 1911, the Secretary of War again transmitted to Congress a letter from the Chief of Engineers, dated January 14, 1911, reporting the progress of the work to date and recommending further appropriations. In his letter the Secretary of War states:

> Until the cofferdam has been completed it will be impossible to prepare an accurate estimate of the sum needed for the completion of the work. With a view to insure the continuance of the work until the meeting of Congress in December next, I concur in the view of the Chief of Engineers that the cost of removing the wreck shall be paid out of the indefinite appropriation which is provided in section 20 of the act of March 3, 1899 (30 Stat. L., 1154), and the draft of legislation to that end is submitted herewith.

The report resulted in a further appropriation of $350,000 for the work, making $650,000 in all.

As soon as certain legal questions which arose out of the verbiage of the acts of May 9 and June 25, 1910, had been settled, on August 2, 1910, in paragraph 1, Special Order No. 38, office Chief of Engineers, a board consisting of Col. W. M. Black, Maj. (now Lieut. Col.) M. M. Patrick, and Capt. (now Maj.) H. B. Ferguson, was appointed and charged with the conduct of the work. The board held its first meeting in Washington on August 29, 1910, and formulated a general plan for the conduct of the work, appointing its junior member, Maj. Ferguson, as executive officer, with a recommendation that he should take station in Habana and have personal supervision of the work. This recommendation was approved, and Maj. Ferguson arrived at Habana, September 9, 1910, the senior officer having arrived on September 7, and having made certain preliminary arrangements with the officials of the Republic of Cuba, with the assistance of the Hon. J. B. Jackson, United States minister. The two senior officers of the board retained their stations and duties in the United States and visited Habana from time to time as their presence there seemed necessary.

The harbor of Habana is formed by an indentation in the north shore of Cuba. It is shaped like a fan, of which the handle is the channel of entrance. The general line of the coast at Habana trends N. 65° E. and the direction of the channel of entrance is N. 125° E. The length of this channel from the entrance at La Punta to the Castillo de la Fuerza, where it widens into the base of the fan, is 4,000 feet, and its general width between the shore lines is 1,300 feet and between the 18-foot contours 800 feet. From opposite La Fuerza the north shore of the harbor turns abruptly to the east and the south curves gradually until its trend is southwest. The greatest spread of the harbor (in a northeast-southwest direction) is 14,000 feet, and its length from La Fuerza to the general line of the head of the harbor, which is formed by a deeply indented line trending northeast-southwest, is 7,400 feet. The harbor is surrounded irregularly by high land on all sides, in which limestone rock crops out at the



PORTION OF

HARBOR OF HAVANA

SHOWING LOCATION OF WRECK OF

U.S.S. MAINE

HAVANA·CUBA·JULY·1·1911·

To accompany annual report.
For the Board
W. M. Black
Col. Corps of Engrs.
Senior Member.

Scale·Nautical Miles·
0 1/8 1/4 3/8 1/2

surface. These facts are of interest since they show why the wave action within the harbor is so small, rarely if ever exceeding 2 feet in height, even when the top of the lighthouse on Morro Castle at the entrance, 144 feet above sea level, is obscured by spray.

The mean tidal range is slightly over 1 foot. The extreme tidal range found was about 2½ feet. The harbor bottom is generally of clay, containing in parts strata of soft rock. In parts of the harbor the clay is overlaid with mud. Near the site of the wreck of the *Maine* the general depth of water was 35 feet. For the first 15 to 20 feet of the harbor bottom the clay was soft and mixed with shells and coral sand. Below the depth of 60 feet the clay is very tough. Rock was found at depths of from 98 to 118 feet.

The U. S. battleship *Maine* was sunk in the harbor at 9.40 on the evening of February 15, 1898, as a result of one or more explosions, while lying at a regular mooring buoy (then numbered 4) 1,575 feet east of the south end of the Machina Wharf and 3,100 feet southeast from La Fuerza. The wreck lay with the bow pointing toward the Machina Wharf, and with the mainmast, the after searchlight platform, wreckage covering the amidship superstructure, and a few pieces of isolated wreckage forward appearing above the level of the water surface. Measurement shows that the keel aft lies at a depth of approximately 48 feet. The depth at which the keel lies at the bow is unknown. Immediately after the disaster a careful investigation was made by a board of naval officers. The proceedings of the board, accompanied by a number of photographs and sketches, were transmitted to Congress by President McKinley on March 28, 1898, and are printed in a public document entitled "Message from the President of the United States Transmitting the Report of the Naval Court of Inquiry upon the Destruction of the U. S. Battleship *Maine* in Havana Harbor," etc.

From the acts of Congress cited and the reports of the debates while the appropriations for the removal of the wreck were pending, it became evident that in addition to the removal of the wreck from the harbor, Congress desired (1) that the remains of the men who went down with the vessel and which had not been recovered should be found if possible and removed to the Arlington National Cemetery for burial; (2) that the mainmast of the ship should be sent to the Arlington Cemetery and there reerected; (3) that the wreck should be so exposed, without derangement of its parts, as to permit all information possible to be obtained as to the nature and location of the explosion or explosions which caused the disaster.

Many plans had been suggested to the department for removing the wreck. Those which showed sufficient thought and knowledge to render them worthy of consideration were of two general classes, (*a*) plans which contemplated the lifting of the wreck bodily from the bottom by chains passed under the keel, actuated by mechanical devices, so that the parts could be lifted and then floated by their own buoyancy or by auxiliary floats; and (*b*) those which provided for surrounding the wreck by a cofferdam, removing the water, exposing the wreck, and then removing it.

After a careful consideration, and with such personal knowledge as could be obtained by a study of the printed message of the President and an inspection of the wreck, the board decided that any plan which contemplated lifting the wreck bodily, even if possible, would lead to such distortion of the broken parts as to defeat one of the objects which Congress had in mind in directing the work to be done. This consideration led to the rejection of all of the plans of that class.

The board then had careful studies made of designs for a cofferdam which could be erected at a minimum cost with materials available, in the open harbor, on a clay foundation, and which would be able to resist the pressure of a head of 50 feet of sea water and soft clay. The design which approved itself to the board as most economical and advantageous under the conditions at Habana, and which was finally adopted, was of a dam elliptical in shape, composed of cylinders 50 feet in diameter, built of interlocking steel sheet piles, driven to a depth of 73 feet, with the cylinders placed tangent to each other, connected on the outer perimeters by short arcs of similar sheet piles, and with the cylinders and connecting sections filled with stiff clay from the harbor bottom near by and rock. The centers of the cylinders were to be on a perimeter of elliptical form, with major and minor axes of 395 feet and 216 feet length, respectively.

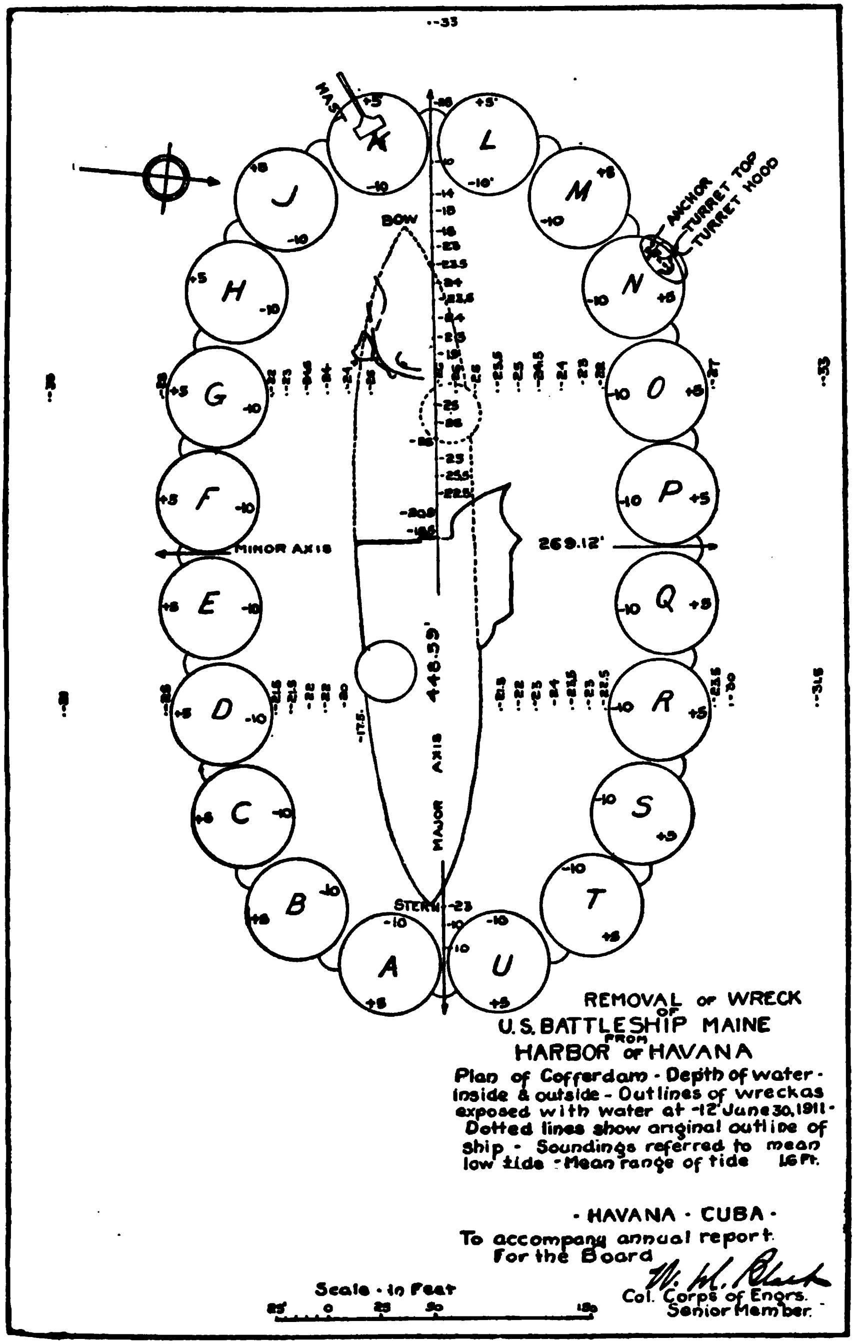
The project further proposed to unwater the dam; to expose the wreck; to remove all remains found, articles of personal property and such parts of the stores and equipment as might be worth salvaging; to remove the destroyed portions of the vessel piece by piece; to bulkhead any portion of the ship sufficiently intact, and then to float that portion and dispose of it as higher authority might direct. On account of the many uncertainties involved in the work, which might require radical changes of plans as the work progressed, it was deemed most economical and advantageous to have the work done by hired labor, with materials purchased and plant hired under contract after inviting proposals, or in open market as prescribed for works of river and harbor improvement.

This project was submitted to the Secretary of War by the Chief of Engineers October 10, 1910, and on the same date was submitted to the President, by whom it was approved October 13, 1910.

The President of the Republic of Cuba and his cabinet officers made every effort to facilitate the work of the board. Customs duties were ordered remitted on all materials and machinery required for the work. Wharf and storage space at Casa Blanca belonging to the Republic were allotted. A number of pieces of floating plant were loaned free of rental, including a dredge, tugboat, floating derrick, drill boats, and dump boats. The secretary of public works, Señor Joaquin Chalons, further offered the services of such of his engineers as might be required and such other aid as his department might be able to give.

In this connection the board desires to acknowledge its indebtedness not only to the officials of the Republic, but also to numerous citizens, business houses, and contracting firms doing business in Cuba, for cordial interest and aid in furthering the work.

Immediately after the arrival of Maj. Ferguson in Habana an office was established and a working force organized. The first work was an examination of the surroundings of the wreck. Its location in the harbor has been described earlier. The general direction of the keel is S. 82° W., looking toward the bow which points toward the Machina Wharf. The forward portion seems to be out of line with the after part. The nature of the bottom found has been stated above—i. e., depth of water, 29 to 35 feet; soft mud composed of red clay and shell



REMOVAL OF WRECK OF U.S. BATTLESHIP MAINE FROM HARBOR OF HAVANA

Plan of Cofferdam - Depth of water - inside & outside - Outlines of wreck as exposed with water at -12' June 30, 1911 - Dotted lines show original outline of ship - Soundings referred to mean low tide - Mean range of tide 1.6 Ft.

· HAVANA · CUBA ·

To accompany annual report.
For the Board
W. M. Black
Col. Corps of Engrs.
Senior Member.

to depths of 55 to 58 feet; hard blue clay to 81 feet; stiff yellow clay and mud from 98 to 118 feet. Isolated pieces of wreckage were found principally around the forward half of the ship, to distances of 75 feet from the keel line on the port side, extending to 70 feet beyond the bow, and on the starboard side to distance of 120 feet. The ship's foremast was found with its fighting top 40 feet forward of the bow, measured along the keel line extended, and 22 feet to port from the same line. The base of the mast was further forward and further to port. The angle between the lines of the keel and mast, respectively, was about 28½°. Wreckage which when removed later was found to consist of the starboard turret hood, turret top, and a large anchor, was found on the outer perimeter of cylinder N. 75 feet forward and 100 feet to starboard (measured on the line of the keel and at right angles thereto) from the position of the turret in the hull. The top is a disk of steel 25 feet in diameter and 1¼ inches thick. It lay at an angle of about 70° with the horizontal, with its upper edge inclined toward the hull and its lower edge at a depth of about 50 feet. The anchor and hood had sunk 15 feet into the mud. In order to test the possibility of driving without distortion long interlocking steel sheet piles in a cylindrical dam, a test cylinder 9 feet 5 inches was driven to a depth of 65 feet. Three ordinary wooden piles were also driven to test resistance. Samples of the clay when weighed wet gave weights of 114 pounds per cubic foot and 124 pounds per cubic foot for the soft and tough clays, respectively.

A cyclonic disturbance passed over Habana on October 13, followed immediately by a second, so that from the 13th to the 18th, inclusive, all work was rendered impossible. The diving and boring outfits and barge on which foremast had been placed were swept from their moorings by the winds and beached. The greater part of the diving apparatus was saved. A dredge, offered by the Cuban Government, was sunk and never repaired sufficiently to be available. During that period the derrick boat was in use, raising the above dredge and other plant belonging to the Cuban Government. Due to the injury to the plant itself, the last half of October was lost.

On October 27 a contract was entered into with the Lackawanna Steel Co. for the delivery on the wharf at Casa Blanca of 4,430 tons of Lackawanna interlocking steel sheet piling, three-eighths-inch web, 35 pounds to the square foot, in lengths of 25, 35, 40, and 50 feet as ordered, with splice bars, bolts, and nuts necessary for assembling into pieces of 75 feet length, at $33.76 per short ton; 1,154 tons of the same piling assembled into three-way pieces, similarly arranged for splicing, at $38.76 per ton; 108 tons of splice bars, bolts, and nuts, bars punched to templet, at $33.76 per ton; steel to be open hearth, containing not more than 0.04 of phosphorus, and to have a tensile strength of 65,000 pounds with a minimum elastic limit of 32,500 pounds per square inch; the interlock was to stand a pull of 9,700 pounds per linear inch; and in shape the elements were not to vary more than one-fourth inch from a right line. Payments were to be made monthly on delivery, with a retain of 5 per cent until completion of order. In addition, a retain of $13.50 per gross ton was reserved. One year after the date of the contract this retain is to be paid, less the value of all piling salvaged and placed in cars at New York City (or other point taking an equivalent freight rate to Buffalo), at a rate of $13.50 per gross ton, unless at the expiration of the said year the contractor grants in writing to the contracting officer a further delay in the delivery of the piling. The first 1,000 tons of the piling were to be shipped within 10 days after receipt of the order, and the remainder was to be shipped as rapidly as the United States might require. Each pile makes 12¾ inches of wall; 16 piles make 17 feet of wall.

During the months of October, November, and December floating plant was collected and altered to adapt it for the work of driving the piles of the cylinders. One 12-inch and one 8-inch centrifugal pump, both direct connected to electric motors and both fitted for pumping sea water under maximum and minimum heads of 65 and 5 feet, respectively, were bought, as were also two, Arnott patent, No. 3, steam pile hammers (weight 3,700 pounds). In addition, one steam hammer was obtained from the T. L. Huston Co. and one was hired from the Cuban Engineering Co. Ordinary pine piles were bought for guides for the cylinder forms and the forms were made. By the end of December the floating plant assembled and in use on the work included—

Two tugs (hired).
Two launches (hired).
One 7-yard clamshell dredge (loaned by the Republic of Cuba).
One hydraulic suction dredge (loaned by the United States Engineer Department).
Four pile drivers (three adapted from plant loaned by Republic of Cuba and one from a derrick scow loaned by United States Navy Department).
Two 100-ton decked scows (bought).
One coal barge (loaned by United States Navy Department).
One steam lighter scow (loaned by United States Engineer Department).
Three dump scows (loaned by Republic of Cuba).
One 50-ton decked scow, with 15-horsepower engine (hired).

The first piles were delivered at the wharf at Casa Blanca on December 6. After receipt and storage there they had to be rehandled to the scows which supplied the drivers. Driving was begun in cylinder S on the same date. During the remainder of the month driving was continued in cylinders C, H, S, and F. The process in general was as follows: An ordinary round pile was first driven accurately on the axis of a cylinder. Around this was assembled the circular form, fixed horizontally by the center pile and floating in the water. A bottom piece of steel piling 50 feet long was then placed against the form and allowed to penetrate into the mud by its weight. The top was usually about 4 feet above the water surface. A bottom piece of 40-foot length was then strung through the interlock of the first piece set and suspended on that piece until its 35-foot top could be placed and bolted fast, when it was allowed to penetrate as far as its weight would admit. This was continued, with bottoms of 50 and 40 feet length alternately. After a number of piles had been set the driving was begun. The closure of the circle was made by the last 15 to 20 piles which were set and then driven together. The closure was made in the perimeters of the cylinders on the outer face of the cofferdam. Two three-way piles were set in each cylinder, about 16 piles outside the line of the ellipse passing through the cylinder centers, and one at the middle of the exterior arc. The first two were for the short arcs joining the cylinders, the other for use should emergency require. The piles were driven until their tops were about 2 feet above the mean low-water plane, placing the bottoms at reference —73. After passing reference —65 the rate of penetration under the hammer was slow. The monthly progress in driving was as follows:

	Set.		Driven.
	Bottoms.	Tops.	
Dec. 6 to 31	520	418	141
Jan. 1 to 31	1,053	1,031	1,219
Feb. 1 to 28	980	1,099	1,140
Mar. 1 to 31	637	642	690
Total			3,190

Of these, 2,986 piles were in the cylinders and 204 in the connecting arcs, an average of 149 piles per cylinder and of 10 per arc.

During the month 3,000 cubic yards of material were dredged by the *Barnard* and 5,075 cubic yards by the *Sagua* (Cuban). The material dredged was placed in cylinders A, B, S, and L, and dumped outside cylinder A, where the natural bottom had a greater depth of soft clay. The dredging was done on the extensive bar near the site of the wreck. This bar is composed of irregular beds of clay containing thin strata of coral rock, and is overlaid by a soft mixture of coral sand and clay, of an average thickness of about 8 feet. The soft materials were wasted and only the hard utilized. The depths to which the clay was excavated averaged from about 20 to 40 feet. It was comparatively easy with the *Sagua* to make the requisite selections, but this dredge is poorly constructed and broke down repeatedly under the tough digging. The *Barnard* is a self-propelling hydraulic dredge designed for use on the lower Mississippi River, in which the cutter head of the suction pipe acts by being dragged over the bottom while the dredge is in motion, the pump discharging over the side or at the stern. The dredge was operated over a definite area by lines attached to heavy anchors and passing around the drums of the hoisting engines. Although not designed for work of the character required in Habana, she was able to cut the clay and rock, though with difficulty and at considerable cost. The character of the material may be understood when it is considered that with a discharge which contained not more than 10 per cent of dredged materials, an ordinary dump scow alongside could have a 100-cubic-yard pocket filled in about 15 minutes. As the beds of hard material were not regular nor uniformly distributed horizontally and vertically, much soft stuff, unfit for filling, was also brought up mingled with the better grades.

The board was very averse to filling the cylinders by the hydraulic process on account of the great strain on the interlocks of the piles which the liquid mud would produce and on account of the length of time which would be required for the clay fill to settle and lose some of its extreme plasticity. However, the board found that the *Sagua* was quite unable to dredge the 70,000 cubic yards required within any reasonable time (its performance averaging about 350 cubic yards per day, with breakdowns in addition), and that no other suitable dipper dredge could be obtained for less than a prohibitory cost. The excellent qualities shown by the material dredged by the

Barnard, its compactness, quickness of settlement, and the steep slopes held above and below water, convinced the board that the filling could be made safely by hydraulic dredging, and the board accepted a liberal offer made by the T. L. Huston Co. to hire their new hydraulic dredge, the *Norman H. Davis*, for this purpose. This dredge is of the type which operates at a fixed point with a spiral cutter at the bow driven by an engine. This dredge was brought to the work on March 27, and during the remainder of the month was occupied in clearing and wasting the soft overlying materials from a space about 400 feet from the cofferdam.

On March 25 cylinder B, which had been practically filled with materials dredged by the *Barnard* and *Sagua*, placed in the cylinder by a small clamshell bucket rigged on one of the pile drivers, opened between the third and fourth piles from the three-way pile of the arc A–B, spreading to a width of 15 feet. The entire fill sank about 3 feet and a portion spilled out, leaving a slope on the remaining fill of about 1 on 1. A portion of the remaining fill was dredged out and 11 injured and bent piles were withdrawn. It was found that the break had occurred at the closure piles. In this cylinder, one of the first closed, the closure was made with five piles driven with a No. 3 Vulcan hammer. It was noted when driving that the closure was made with difficulty, the last piles driving very hard, and orders were then given to make future closures with not less than 15 piles. When the injured piles were withdrawn it was found that the fingers of the interlock of the closure pile had been straightened, so that when the pressure of the fill was applied the interlock opened. Since the stresses exerted were much less than the tested strength of the interlock it was evident that the straightening had been done in the driving, with too small a number of piles to allow sufficient total play in the interlock and with too heavy a hammer. The piles showed plainly where the driving out had occurred. The break was repaired by driving 13 new piles in place of those bent and removed, of which 12 were the ordinary steel piles and 1 was wedge-shaped, 12½ inches wide at bottom and 35 inches wide at top. The cylinder was refilled.

The cylinders as driven were not all in contact at the theoretical points of tangency. To hold the fill in the sectors within the joining arcs, one to three palm piles 45 feet long were driven between each pair of cylinders at a point slightly nearer the interior of the cofferdam than the theoretical point of tangency. To increase the holding power, a riprap base was made inside, and their tops were fastened to the adjacent cylinders with wire rope.

In order to obtain some record of the internal pressures, 11 pressure gauges were placed in the cylinders; 4 in cylinder H, at depths of 20, 30, 40, and 50 feet below the plane of mean low water; 4 in cylinder F, of which 2 were on a wooden pile alongside of pile No. 53, at elevations of −30 feet and −40 feet; 2 on a wooden pile alongside of piles Nos. 133 and 134, at elevations of −30 feet and −40 feet; and 3 in cylinder G attached to the drain box in the axis at elevations of −20, −30, and −40 feet. One pressure gauge was placed on a wooden pile outside cylinder F, alongside piles Nos. 133 and 134 at an elevation of −40 feet.

The filling of the cylinders was continued until May 11, when the *Norman H. Davis* was discharged. She had dredged in all 57,048 cubic yards, filling all cylinders and arcs excepting A and B. The overflow from the fill caused a further deposit outside and inside the cylinders. The *Sagua* dredged 750 cubic yards, of which 430 cubic yards were of good materials. One thousand and eighty-six cubic yards of stone were also placed partly inside of cylinders N and O, and partly around the palm piles and within the sectors. A drain box of 2-inch by 12-inch plank, suitably braced and having an outside horizontal cross section of 3 by 3 feet, was placed in each of cylinders L, M, N, O, Q, F, G, H, J, and K. The drain boxes are located on the axis and extend to a depth of 50 feet. Sluiceways for flooding the cofferdam when necessary were placed across the tops of cylinders B and C. That in B has a section of 3 by 3 feet and that of C 3 by 7 feet. They are closed by sliding wooden gates. The steel piles having been driven to within 2 feet of the mean low-water plane, the shells of the cylinders were built up to an elevation of + 4 feet with wooden plank set vertically in the fill.

On May 8, after the fill within had reached an elevation of 3 feet and while pumping was in progress, cylinder N broke open. The opening was formed at the thirteenth pile from the three-way pile of the arc N–O, being about 30 feet wide at top. The adjacent piles were bent down until their tops were submerged about 7 feet. A portion of the fill next to the opening flowed out, but the greater part remained in the cylinder, showing slopes of about 1/1. No change occurred in the sector N–M near the break. Thirty-five piles were withdrawn—a task of great difficulty, since the upper parts were badly bent, the portions below the mud level not having been moved. This last was the more remarkable, since the site of cylinder N had been dredged to a depth of about 50 feet to clear away the wreckage hereinbefore reported as found there, and refilled with new material to a depth of about 30 feet. A new closure was made with 43 piles, making a total of 3,200 in the dam. The cylinder was refilled by means of a clamshell dredge, the work being completed so as to permit the unwatering of the cofferdam to begin June 5. On removing the piling and examining into the cause of the breakage it was found that in driving one of the piles had become twisted and had left the interlock of the adjacent pile at its splice, and that this pile, which had a 40-foot top, must have been defective, for under the stresses caused by the fill it tore through its web at about its middle line from bottom to top.

The two pumps previously mentioned had been placed on floats within the cofferdam. An electric cable for light and power had been laid between a small transformer house built on piles just outside of the cofferdam and the Luz Wharf at Habana.

On April 25 the S. S. *Havana*, of the Ward Line, in going to her moorings at the Luz Wharf, dragged the cable, which broke at the transformer house and burned out. A new cable had to be laid. This work was completed by the middle of May. On June 5 unwatering was started with the 8-inch pump and the level of water within the cofferdam was reduced to −5. On June 15 and 16 the water was lowered to −10 and on June 20 to −15.[1] A slight movement inward was observed on the part of the cylinders, and on the 22d the water level was raised to −12 and the cylinders were kept under a head of between 10 and 12 feet during the remainder of the month. The leakage through the cylinders was very slight, raising the level of the water inside about 0.5 foot in 6 hours. Investigation having shown that the clay filling was yet very plastic, the drainage of the cylinders and the grading of the top of the fill by removing the clay from the inner perimeters of the cylinders to the outer was begun and carried on vigorously. Stone in amount 8,000 yards was ordered and as delivered was placed against the palm piles in the inner sectors between the cylinders. The cylinders are drained by placing steam siphons in the drain boxes and in 6-inch and 8-inch perforated pipes sunk into the cylinders not provided with larger drains. Leaks of some magnitude developed in cylinder F, and an examination by the diver showed that many of the bolts holding the fishplates which connect the piling of cylinder F had been jogged out in the driving and that water was entering through the bolt holes. These were plugged as far as possible, and a deposit of clay was placed outside the cylinder and banked up to a height of about −23, reducing the leak to insignificant proportions. In the later work the bolts had been upset before driving, but several of the cylinders had been driven before this was done. An examination was made by the diver of these cylinders, and such bolt holes as were found empty were plugged. By the close of the month the dam was fairly tight and the clay filling was rapidly consolidating, clay from the inside of the cylinder tops being piled up on the outside as the fill settles.

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[1] The depth of unwatering reached −20 feet by July 20 and −22 feet by July 26, after which further material to be removed within and around the wreck within the cofferdam was mainly soft, sticky mud.

The main deck of the *Maine* as far as it remained in place, together with the captain's cabin in the superstructure on that deck, were exposed when the water reached −12. The deck and floor of the cabin were found to be covered to a depth of 3 to 5 feet with a deposit of mud, oyster shells, and a coraline formation. This was cleared away, and all articles of equipment, furniture, and armament found were turned over to a representative of the Navy Department and by him placed on the naval collier *Leonidas*, which had been sent to Habana for that purpose. The human remains discovered up to June 30 consisted of two arm bones, the bones of a foot, and two rib bones. The metal of the *Maine* exposed was found to be badly corroded. In a box by the after turret were found a quantity of web belts, with bayonets in their scabbards attached and with cartridges in their pockets. Electrical action had apparently set up between the steel of the bayonets and the cartridge cases, which had rotted the steel completely and deposited a portion of it in the form of an iron oxide on and around the cartridges, making of the belts, scabbards, and cartridges a solid mass. Similarly, an officer's sword had been eaten away completely at the junction of the blade and the hilt. Some articles, such as the electric-light fixtures, rubber bands, and rubber mats, were found in a remarkable state of preservation. Textile fabrics had almost entirely disappeared. Arrangements are being made for cutting up the steel of the destroyed portion of the wreck into manageable pieces with an oxy-acetylene blowpipe plant and its removal to barges by derricks.

As shown by the money statement attached, out of the $650,000 appropriated up to June 30 there had been expended or pledged the sum of $462,476.32, leaving a balance of $187,523.68, which will be sufficient to carry on the work until December, but will probably be insufficient to complete all the work.

From the best information now available, it appears that the fter portion of the vessel, from the stern to about frame 54, a ngth of about 122 feet, measured along the berth deck, has been amaged but little by the explosion. Forward of frame 54, for a ngth of 51 feet to frame 41, the portion of the superstructure over he after boiler room is in place, but is shattered and twisted. On he starboard side the side of the ship seems to be intact nearly to rame 41. On the port side the main deck has been torn loose aft of rame 41, and the ship's side blown out to about 15 feet from frame 4. Forward of frame 41 the ship seems to have been entirely estroyed. For about 60 feet little or nothing is seen, and it is robable that the ship may have been cut through. Farther forward a twisted mass of steel which is out of line with the after portion f the wreck and retains no resemblance to a ship.

The exposure of the wreck already made has demonstrated clearly he impracticability of raising the entire wreck bodily from the mud, nd the necessity of adopting the cofferdam method. The unprecedented character of the work and the uncertainty attending the dvent of atmospheric disturbances have made anything like a liable estimate of cost impossible.

The cofferdam is now practically completed. It is unusually ght and appears to be stable. With the completion of the stone e originally provided for, little will remain to be done to it as far s can be foreseen, though a recurrence of conditions similar to the clonic disturbances of last October may cause damage and delay.

The removal to Arlington Cemetery of the remains of the dead und, and the removal of the mainmast of the ship and its erection Arlington Cemetery, as required by Congress, are simple matters. he problems now confronting the board are the removal of the reckage from its bed of mud (which has been increased in depth bout 10 feet by the work incident to the construction of the cofferam), the disposal of the wreckage, and the restoration of the site its original condition. Some of the parts of the wreckage, such s armor plates, turret top, etc., weigh from 15 to 25 tons each. The 0-inch guns weigh about 40 tons each. This work presents diffiulties, but the board believes that the greatest uncertainties in the st of the work are those connected with the construction and nwatering of the cofferdam.

Making reasonable allowance for the unknown contingencies, he board now estimates that the aggregate cost will probably not xceed the appropriations already made by more than $250,000.

Estimate of additional funds required.

mount required for expenditure in fiscal year ending June 30, 1912, exclusive of balance unexpended July 1, 1911	$250,000

APPROPRIATIONS.

ay 9, 1910	$100,000
ne 25, 1910	200,000
ar. 4, 1911	350,000
	650,000

ABSTRACTS OF CONTRACTS IN FORCE DURING FISCAL YEAR ENDING JUNE 30, 1911.

Contractor: Lackawanna Steel Co., Buffalo, N. Y.

Amount and character of work: Furnishing 4,430 tons (2,000 pounds each) Lackawanna interlocking steel sheet piling, with bolts and splice plates, at $33.76 per ton; 115.4 tons, more or less, of same piling assembled into three-way piles, at $38.76 per ton; 108 tons, more or less, of bolts and splice bars for fabricated pieces, at $33.76 per ton.

The contractor agrees to allow $13.50 per gross ton for salvaged steel piling placed f. o. b. cars New York within one year after date of contract, this time to be extended at the option of the contractor.

Date of approval: November 10, 1910.

Date for beginning work: November 20, 1910.

Date of completion: November 10, 1911, unless time is extended.

APPENDIX L L L.

LAWS

AFFECTING

THE CORPS OF ENGINEERS, UNITED STATES ARMY.

SIXTY-FIRST CONGRESS, THIRD SESSION, AND SIXTY-SECOND CONGRESS, FIRST SESSION, 1910–1911.

Dec. 20, 1910.
[S. 6910.]
[Public, No. 326.]

CHAP. 5.—An Act To provide for the extension of Reno road, in the District of Columbia.

Dist. Columbia.
Reno Road.
Condemning land for extending.
Vol. 34, p. 151.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That under and in accordance with the provisions of subchapter one of chapter fifteen of the Code of Law for the District of Columbia, within six months after the passage of this Act, the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to institute in the supreme court of the District of Columbia a proceeding in rem to condemn the land that may be necessary for the extension of Reno road, as laid down on the permanent system of highway plans, from Fessenden street to Chesapeake street, with a width of one hundred feet.

Damages assessed as benefits.

Proviso.
Limit of assessment.

SEC. 2. That the entire amount found to be due and awarded by the jury in said proceeding as damages for and in respect of the land to be condemned for said extension, plus the costs and expenses of said proceeding, shall be assessed by the jury as benefits: *Provided*, That nothing in said subchapter one of chapter fifteen of said code shall be construed to authorize the jury to assess less than the aggregate amount of the damages awarded for and in respect of the land to be condemned and the costs and expenses of the proceeding hereunder.

Appropriation for expenses, etc.

Payment of awards.

SEC. 3. That there is hereby appropriated from the revenues of the District of Columbia an amount sufficient to pay the necessary costs and expenses of the condemnation proceedings taken pursuant hereto and for the payment of amounts awarded as damages, to be repaid to the District of Columbia from the assessments for benefits and covered into the Treasury to the credit of the revenues of the District of Columbia.

Approved, December 20, 1910.

Dec. 21, 1910.
[H. R. 21331.]
[Public, No. 327.]

CHAP. 6.—An Act For the purchase of land for widening Park Road, in the District of Columbia.

Dist. Columbia.
Park Road NW.
Purchase of land for widening.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to purchase, for widening Park road, the triangular lot designated as "Lot A," in Chapin Brown's subdivision of parts of Mount Pleasant and Pleasant Plains, called "Ingleside," as recorded in liber county numbered eight, folio thirty-seven, of the records of the office of the surveyor of the District of Columbia, at a price deemed by them to be reasonable, not exceeding the sum of three thousand six hundred dollars.

Appropriation.
Half from District revenues.

SEC. 2. That the sum of three thousand six hundred dollars, or so much thereof as may be necessary, is hereby appropriated for the purchase of said lot, payable one half from the revenues of the District of Columbia and the other half out of any moneys in the United States Treasury not otherwise appropriated.

Approved, December 21, 1910.

Jan. 12, 1911.
[H. R. 6867.]
[Public, No. 332.]

CHAP. 11.—An Act To authorize the city of Sturgis, Michigan, to construct a dam across the Saint Joseph River.

St. Joseph River, Sturgis, Mich., may dam.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the city of Sturgis, a corporation organized under the laws of the State of Michigan, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the Saint Joseph River, at or near its intersection with the section line between sections one and two, township six south, range eleven west, Saint Joseph County, in the State of Michigan, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, January 12, 1911.

Jan. 12, 1911.
[H. R. 25775.]
[Public, No. 333.]

CHAP. 12.—An Act To authorize the Great Northern Development Company to construct a dam across the Mississippi River from a point in Hennepin County to a point in Anoka County, Minnesota.

Mississippi River.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Great Northern Development Company, a

Great Northern Development Co. may dam, at Coon Creek Rapids, Minn.

corporation organized under the laws of the State of Maine, with special permit to do business in Minnesota, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the Mississippi River at Coon Creek Rapids from a point in lot one, section two, township one hundred and nineteen, range twenty-one, Hennepin County, to a point in lot four, section twenty-seven, township thirty-one, range twenty-four, Anoka County, all in the State of Minnesota, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Vol. 34, p. 386.

Amendment.

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, January 12, 1911.

Jan. 16, 1911.
[H. R. 26583.]

[Public, No. 334.]

CHAP. 18.—An Act To authorize the city of Drayton, North Dakota, to construct a bridge across the Red River of the North.

Red River of the North.
Drayton, N. Dak., may bridge.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the city of Drayton, in the State of North Dakota, be, and is hereby, authorized to construct, maintain, and operate a bridge and approaches thereto, across the Red River of the North at a point suitable to the interests of navigation, at or near the city of Drayton, between said city of Drayton, in the State of North Dakota, and the State of Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-three, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, January 16, 1911.

Jan. 20, 1911.
[H. R. 23081.]

[Private, No. 182.]

CHAP. 24.—An Act For the relief of the family of Samuele Badolato.

Samuele Badolato.
Appropriation for family of.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and is hereby, authorized and directed to pay, out of any money in the Treasury not otherwise appropriated, the sum of five hundred dollars and eighty cents, and said sum of five hundred dollars and eighty cents is hereby appropriated, to be paid in such portions and under such regulations as the Secretary of Commerce and Labor may prescribe, to Antonia Giuliana Badolato, Marianna Badolato, Samuele Badolato, and Antonia Critelli Badolato, being, respectively, the widow, the two minor children, and the widowed mother of Samuele Badolato, an employee of the United States, who was killed in the course of his employment upon river and harbor improvements, New Lock and Dam Numbered Five, Monongahela River, West Brownsville, Pennsylvania, on April twenty-first, nineteen hundred and nine, such sum being the amount to which the above relatives would have been entitled under the provisions of the Act of Congress of May thirtieth, nineteen hundred and eight, but which they did not receive because the required affidavit of claim was not filed on their behalf within ninety days after the death, as required by section four of the said Act.

Vol. 35, p. 556.

Approved, January 20, 1911.

Feb. 2, 1911.
[S. 10053.]

[Public, No. 337.]

CHAP. 31.—An Act To extend the time within which the Baltimore and Washington Transit Company of Maryland shall be required to put in operation its railway in the District of Columbia, under the provisions of an act of Congress approved June eighth, eighteen hundred and ninety-six, as amended by an act of Congress approved May twenty-ninth, nineteen hundred and eight.

Dist. Columbia.
Baltimore & Washington Transit Co.
Time for completion extended.
Vol. 29, p. 264.
Vol. 35, p. 473.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time within which the Baltimore and Washington Transit Company of Maryland is required to put in operation its railway in the District of Columbia, under the provisions of an Act of Congress approved June eighth, eighteen hundred and ninety-six, as amended by an Act approved May twenty-ninth, nineteen hundred and eight, be, and the same is hereby, extended for a term of fifteen months from the twenty-eighth day of May, nineteen hundred and ten, and that all the franchises, rights, privileges, and powers conferred by said Acts, or either of them, may be enjoyed and exercised by said railway, or its successors in interest, as fully and completely as if said railway had been completed and put in operation prior to May twenty-ninth, nineteen hundred and ten: *Provided*, That said Baltimore and Washington Transit Company shall be subject to all the duties, conditions, and limitations provided in the Acts of Congress approved June eighth, eighteen hundred and ninety-six. and May twenty-ninth, nineteen hundred and eight, and not inconsistent with the provisions hereof.

Proviso.
Limitations, etc., continued.

Approved, February 2, 1911.

Feb. 4, 1911.
[S. 10268.]

[Public, No. 342.]

CHAP. 36.—An Act Granting to the Ozark Power and Water Company authority to construct a dam across White River, Missouri.

White River, Mo.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Ozark Power and Water Company, a

Ozark Power & Water Co. may dam, in Taney County.

corporation organized under the laws of the State of Missouri, with principal offices in the city of Saint Louis, Missouri, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the White River at a point suitable to the interests of navigation at or near its northernmost point, in Taney County, Missouri, approximately ten miles downstream from the towns of Hollister and Branson and four miles upstream from the town of Forsyth, county seat of Taney County, in the State of Missouri, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 4, 1911.

Feb. 4, 1911.
[S. 10304.]
[Public, No. 343.]

CHAP. 37.—An Act To authorize the construction, maintenance, and operation of a bridge across the Tombigbee River near Iron Wood Bluff, in Itawamba County, Mississippi.

Tombigbee River, Miss. Itawamba County may bridge, near Iron Wood Bluff.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the board of supervisors of Itawamba County, Mississippi, is hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the Tombigbee River at a point suitable to the interests of navigation near Iron Wood Bluff, in Itawamba County, Mississippi, in accordance with the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 4, 1911.

Feb. 9, 1911.
[S. 9449.]
[Public, No. 346.]

CHAP. 42.—An Act To provide a commission to secure plans and designs for a monument or memorial to the memory of Abraham Lincoln.

Lincoln Memorial Commission created.
Composition, duties, etc.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That William H. Taft, Shelby M. Cullom, Joseph G. Cannon, George Peabody Wetmore, Samuel Walker McCall, Hernando D. Money, and Champ Clark are hereby created a commission, to be known as the Lincoln Memorial Commission, to procure and determine upon a location, plan, and design for a monument or memorial in the city of Washington, District of Columbia, to the memory of Abraham Lincoln, subject to the approval of Congress.

Employment of artists, etc.

SEC. 2. That in the discharge of its duties hereunder said commission is authorized to employ the services of such artists, sculptors, architects, and others as it shall determine to be necessary, and to avail itself of the services or advice of the Commission of Fine Arts, created by the Act approved May seventeenth, nineteen hundred and ten.

Commission of Fine Arts.
Vol. 36, p. 371.

Selection of site.

SEC. 3. That the construction of the monument or memorial, herein and hereby authorized, shall be upon such site as shall be determined by the commission herein created, and approved by Congress, and said construction shall be entered upon as speedily as practicable after the plan and design therefor is determined upon and approved by Congress, and shall be prosecuted to completion, under the direction of said commission and the supervision of the Secretary of War, under a contract or contracts hereby authorized to be entered into by said Secretary in a total sum not exceeding two million dollars.

Construction, etc.

Contracts.
Cost.

Filling vacancies.

SEC. 4. That vacancies occurring in the membership of the commission shall be filled by appointment by the President of the United States.

Appropriation.

SEC. 5. That to defray the necessary expenses of the commission herein created and the cost of procuring plans or designs for a memorial or monument, as herein provided, there is hereby appropriated the sum of fifty thousand dollars, to be immediately available.

Annual estimates.

SEC. 6. That said commission shall annually submit to Congress an estimate of the amount of money necessary to be expended each year to carry on the work herein authorized.

Inconsistent laws repealed.
Vol. 32, p. 486.

SEC. 7. That all Acts or parts of Acts inconsistent herewith are hereby repealed.

Approved, February 9, 1911.

Feb. 13, 1911.
[S. 4239.]

[Public, No. 347.]

CHAP. 43.—An Act To amend section one hundred and eighty-three of the Revised Statutes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section one hundred and eighty-three of the Revised Statutes of the United States be, and is hereby, amended so as to read as follows:

Oaths in investigations.
R. S., sec. 183, p. 29, amended.
Oaths to witnesses.

"SEC. 183. Any officer or clerk of any of the departments lawfully detailed to investigate frauds on, or attempts to defraud, the Government, or any irregularity or misconduct of any officer or agent of the United States, and any officer of the Army, Navy, Marine Corps, or Revenue-Cutter Service, detailed to conduct an investigation, and the recorder, and if there be none the presiding officer, of any military, naval, or Revenue-Cutter Service board appointed for such purpose, shall have authority to administer an oath to any witness attending to testify or depose in the course of such investigation."

Executive officers may administer.
Army, Navy, etc., added.

Approved, February 13, 1911.

Feb. 13, 1911.
[S. 5379.]
[Public, No. 348.]

CHAP. 44.—An Act To provide for the erection of a monument to commemorate the battle of Guilford Court House, North Carolina, and in memory of Major-General Nathanael Greene and the officers and soldiers of the Continental Army who participated with him in the battle of Guilford Court House, North Carolina.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sum of thirty thousand dollars be, and the same is hereby, authorized to be appropriated, out of any money in the Treasury not otherwise appropriated, for the erection of a monument on the battlefield of Guilford Court House, in Guilford County, North Carolina, to commemorate the great victory won there on March fifteenth, seventeen hundred and eighty-one, by the American forces, commanded by Major-General Nathanael Greene, and in memory of Major-General Nathanael Greene and the officers and soldiers of the Continental Army who participated in the battle of Guilford Court House: *Provided*, That the money authorized to be appropriated as aforesaid shall be expended under the direction of the Secretary of War, and the plans, specifications, and designs for such monument shall be first approved by the Secretary of War, with the assistance of the officers of the Guilford Battle Ground Company, before any money so authorized to be appropriated is expended: *And provided further*, That the site for said monument within the limits of said battlefield of Guilford Court House shall be selected by the Secretary of War and donated free of cost to the United States: *And provided further*, That when said monument is erected the responsibility for the care and keeping of the same shall be and remain with the Guilford Battle Ground Company, it being expressly understood that the United States shall have no responsibility therefor; and it being further understood that said Guilford Battle Ground Company shall provide for the public use an open highway thereto.

Guilford Court House, N. C.
Appropriation authorized for battlefield memorial monument.
Post, p. 3142.

Provisos.
Approval of plans.

Donation of site.

Future care.

Approved, February 13, 1911.

Feb. 13, 1911.
[S. 6693.]
[Public, No. 352.]

CHAP. 48.—An Act To amend an act entitled "An act permitting the building of a dam across the Mississippi River at or near the village of Sauk Rapids, Benton County, Minnesota," approved February twenty-sixth, nineteen hundred and four.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section three of an Act entitled "An Act permitting the building of a dam across the Mississippi River at or near the village of Sauk Rapids, Benton County, Minnesota," approved February twenty-sixth, nineteen hundred and four, be, and the same is hereby, amended so as to read as follows:

Mississippi River.
Dam across at Sauk Rapids, Minn.
Vol. 33, p. 58, amended.
Post, p. 3072.

"SEC. 3. That this Act shall be null and void unless the construction of the dam herein authorized be com-

Time extended for construction.

Vol. 34, p. 1058. menced on or before the first day of July, anno Domini nineteen hundred and ten, and completed within two years from that date."

Approved, February 13, 1911.

Feb. 13, 1911. [S. 8592.]

[Public, No. 356.]

CHAP. 52.—An Act To authorize the construction of a bridge across the Missouri River between Lyman County and Brule County, in the State of South Dakota.

Missouri River.

White River Valley Ry. Co. may bridge at Chamberlain, S. Dak.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the White River Valley Railway Company is hereby authorized to construct and maintain a railroad bridge, and approaches thereto, across the Missouri River, extending from some convenient and practicable point, suitable to the interests of navigation, on the west bank of said river in the county of Lyman to some convenient and practicable point in or near the city of Chamberlain, in Brule County, in the State of South Dakota, in accordance with the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 13, 1911.

Feb. 13, 1911. [S. 9552.]

[Public, No. 358.]

CHAP. 54.—An Act To authorize the construction of a bridge across Saint John River, Maine.

St. John River.

Maine and Canada may bridge, between Van Buren and St. Leonards.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby given to the construction, maintenance, and operation by the State of Maine and the Dominion of Canada, jointly, of a bridge now in course of erection across Saint John River between Van Buren, Maine, and Saint Leonards, New Brunswick, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six, said bridge to be used only as a common highway for passengers and common vehicles, and in no case used for steam, electric, or other railways.

Vol. 34, p. 84.

Railways excluded.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 13, 1911.

CHAP. 56.—An Act Granting to Herman L. Hartenstein the right to construct a dam across the Saint Joseph River, near Mottville, Saint Joseph County, Michigan.

Feb. 13, 1911.
[S. 10288.]
[Public, No. 360.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Herman L. Hartenstein, a citizen of the State of Michigan, his heirs and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the Saint Joseph River, at a point suitable to the interests of navigation within one mile up the stream from the highway bridge, at the village of Mottville, Saint Joseph County, in the State of Michigan, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

St. Joseph River.
Herman L. Hartenstein may dam, near Mottville.
Public Laws, 2d sess., p. 593.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

SEC. 3. That the Act entitled "An Act to authorize Herman L. Hartenstein to construct a dam across the Saint Joseph River, near the village of Mottville, Saint Joseph County, Michigan," approved March second, nineteen hundred and seven, is hereby repealed.

Former act repealed.
Vol. 34, p. 1254.

Approved, February 13, 1911.

CHAP. 57.—An Act Extending the provisions of the act approved March tenth, nineteen hundred and eight, entitled "An Act to authorize A. J. Smith and his associates to erect a dam across the Choctawhatchee River in Dale County, Alabama."

Feb. 13, 1911.
[S. 10324.]
[Public, No. 361.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for completing the construction of the dam authorized by the Act entitled "An Act to authorize A. J. Smith and his associates to erect a dam across the Choctawhatchee River, in Dale County, Alabama," approved March tenth, nineteen hundred and eight, is hereby extended to one year from and after the passage of this Act.

Choctawhatchee River.
Time extended for damming, by A. J. Smith et al.
Vol. 35, p. 40, amended.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 13, 1911.

CHAP. 68.—An Act To authorize S. G. Guerrier, of Atchison, Kansas, to construct a bridge across the Missouri River near the city of Atchison, Kansas.

Feb. 15, 1911.
[S. 10594.]
[Public, No. 363.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That S. G. Guerrier, of Atchison, State of Kansas,

Missouri River.

S. G. Guerrier may bridge, at Atchison, Kans.
Vol. 34, p. 84.

and his assigns, are hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the Missouri River, at a point suitable to the interests of navigation, at or near the city of Atchison, in the county of Atchison, in the State of Kansas, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

Feb. 15, 1911.
[H. R. 29715.]
[Public, No. 365.]

CHAP. 70.—An Act To extend the time for commencing and completing bridges and approaches thereto across the Waccamaw River, South Carolina.

Waccamaw River.
Time extended for bridging, at Star Bluff and Conway, S. C.
Vol. 36, p. 179.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for commencing and completing the bridges and approaches thereto across the Waccamaw River by the Building Commission of Horry County, South Carolina, its successors and assigns, one at or near Star Bluff and the other at or near Conway, in the State of South Carolina, as authorized by the Act entitled "An Act to authorize the construction, maintenance, and operation of various bridges across and over certain navigable waters, and for other purposes," approved August fifth, nineteen hundred and nine, is hereby extended one year and three years, respectively, from the date of the approval of this Act.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

Feb. 15, 1911.
[H. R. 30149.]
[Public, No. 366.]

CHAP. 71.—An Act To transfer the military reservation known as Fort Trumbull, situated at New London, Connecticut, from the War Department to the Treasury Department, for the use of the Revenue-Cutter Service.

Fort Trumbull, Conn.
Reservation transferred to Revenue-Cutter Service.
Proviso.
Use of wharf continued.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he is hereby, authorized and directed to transfer the military reservation known as Fort Trumbull, situated at New London, in the State of Connecticut, to the Treasury Department, for the use of the Revenue-Cutter Service: *Provided,* That the continued use by the War Department, concurrent with the Treasury Department, of the present dock and approaches thereto be reserved to the War Department in order that harbor boats stationed in the artillery district of New London may tie up there when necessary.

Approved, February 15, 1911.

CHAP. 72.—An Act To authorize the Fargo and Moorhead Street Railway Company to construct a bridge across the Red River of the North.

Feb. 15, 1911.
[H. R. 30793.]

[Public, No. 367.]

Red River of the North.
Fargo & Moorhead Street Ry. Co. may bridge, Fargo, N. Dak.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Fargo and Moorhead Street Railway Company, a corporation organized under the laws of North Dakota, its successors and assigns, are hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the Red River of the North at a point suitable to the interests of navigation, at or near the city of Fargo, in the county of Cass, in the State of North Dakota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

CHAP. 73.—An Act To authorize the Chicago Great Western Railroad Company, a corporation, to construct a bridge across the Mississippi River at Saint Paul, Minnesota.

Feb. 15, 1911.
[H. R. 30890.]

[Public, No. 368.]

Mississippi River.
Chicago Great Western R. R. Co. may bridge, St. Paul, Minn.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Chicago Great Western Railroad Company, a corporation organized under the laws of Illinois, its successors and assigns, are hereby authorized to construct, maintain, and operate a bridge and approaches thereto, across the Mississippi River at a point suitable to the interests of navigation, at or in Saint Paul, in the county of Ramsey, in the State of Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

CHAP. 74.—An Act To authorize the Great Western Land Company, of Missouri, to construct a bridge across Black River.

Feb. 15, 1911.
[H. R. 30899.]

[Public, No. 369.]

Black River.
Great Western Land Co. may bridge, Poplar Bluff, Mo.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Great Western Land Company, a corporation organized under the laws of the State of Missouri, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Black River at a point suit-

Vol. 34, p. 84.

able to the interests of navigation at or near and below the town of Poplar Bluff, in Butler County, in the State of Missouri, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

Feb. 15, 1911.
[H. R. 31171.]
[Public, No. 370.]

CHAP. 75.—An Act To amend an act entitled "An act to authorize the construction of a bridge across the Monongahela River, in the State of Pennsylvania, by the Liberty Bridge Company," approved March second, nineteen hundred and seven.

Monongahela River.
Time extended for bridging, by Liberty Bridge Co., at Pittsburg.
Vol. 34, p. 1235.
Vol. 35, pp. 45, 638.
Vol. 36, p. 269.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section two of an Act entitled "An Act to authorize the construction of a bridge across the Monongahela River, in the State of Pennsylvania, by the Liberty Bridge Company," approved March second, nineteen hundred and seven, as amended by the Acts approved March sixteenth, nineteen hundred and eight, February eighteenth, nineteen hundred and nine, and April second, nineteen hundred and ten, be, and is hereby, further amended to read as follows:

Time of construction.

"SEC. 2. That this Act shall be null and void if actual construction of the bridge herein authorized be not commenced within one year and completed within three years from March fifteenth, nineteen hundred and eleven."

Approved, February 15, 1911.

Feb. 15, 1911.
[H. R. 31648.]
[Public, No. 371.]

CHAP. 76.—An Act To authorize the county of Hamilton, in the State of Tennessee, to construct a bridge across the Tennessee River at Chattanooga, Tennessee.

Tennessee River.
Hamilton County may bridge, Chattanooga, Tenn.
Location.
Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county of Hamilton, in the State of Tennessee, be, and is hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Tennessee River, at a point suitable to the interests of navigation, between a point four hundred feet north of West Sixth Street on the north, and Nineteenth Street (formerly Henry Street) on the south, in the city of Chattanooga, Tennessee, to the opposite bank of said Tennessee River, in said county of Hamilton, in the State of Tennessee, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

CHAP. 77.—An Act To authorize the county of Hamilton, in the State of Tennessee, to construct a bridge across the Tennessee River at Chattanooga, Tennessee.

Feb. 15, 1911.
[H. R. 31649.]
[Public, No. 372.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county of Hamilton, in the State of Tennessee, be, and is hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Tennessee River, at some point on said Tennessee River suitable to the interests of navigation, above or below the present bridge from Walnut Street, in the city of Chattanooga, to Hill City, in the State of Tennessee, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Tennessee River.
Hamilton County may bridge, Chattanooga, Tenn.
To Hill City.
Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 15, 1911.

CHAP. 78.—An Act Extending the time for commencing and completing the bridge authorized by an act approved April twenty-third, nineteen hundred and six, entitled "An act to authorize the Fayette Bridge Company to construct a bridge over the Monongahela River, Pennsylvania, from a point in the borough of Brownsville, Fayette County, to a point in the borough of West Brownsville, Washington County."

Feb. 15, 1911.
[H. R. 31656.]
[Public, No. 373.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for commencing and completing the bridge authorized by the Act entitled "An Act to authorize the Fayette Bridge Company to construct a bridge over the Monongahela River, Pennsylvania, from a point in the borough of Brownsville, Fayette County, to a point in the borough of West Brownsville, Washington County," approved April twenty-third, nineteen hundred and six, is hereby extended one and three years, respectively, from the twenty-fifth day of June, nineteen hundred and eleven.

Monongahela River.
Time extended for bridging, by Fayette Bridge Co., at Brownsville, Pa.
Vol. 34, p. 128.
Vol. 36, p. 870.

SEC. 2. That the bridge authorized to be constructed by said Act shall be constructed in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Construction.
Vol. 34, p. 84.

SEC. 3. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 15, 1911.

Feb. 15, 1911.
[H. R. 31859.]
[Public, No. 374.]

CHAP. 79.—An Act To authorize the Chucawalla Development Company to build a dam across the Colorado River at or near the mouth of Pyramid Canyon, Arizona; also a diversion intake dam at or near Black Point, Arizona, and Blythe, California.

Colorado River.
Chucawalla Development Co. may dam, at mouth of Pyramid Canyon.
Diversion intake dam at Black Point, Ariz.
Construction.
Vol. 34, p. 386.
Provisos.
Time for construction.
Secretary of Interior to approve plans, etc.
Indian rights, etc.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Chucawalla Development Company, a corporation organized under the laws of the State of California, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the Colorado River at the mouth of Pyramid Canyon, known as “Bulls Head damsite,” about twenty-two miles north of Fort Mohave, Mohave County, Arizona, and a portion of said site being located in Lincoln County, Nevada; also a diversion intake dam, ten feet high, to be located at or near Black Point, about twenty miles north and upstream from the town of Ehrenburg, Yuma County, Arizona, and about twenty miles north and above the town of Blythe, Riverside County, California, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled “An Act to amend an Act entitled ‘An Act to regulate the construction of dams across navigable waters,’ approved June twenty-first, nineteen hundred and six”: *Provided,* That the actual construction of said dams shall be begun within two years and completed within five years from the date of the passage of this act: *And provided further,* That the actual construction of said dams shall not be commenced until the plans and specifications therefor shall have been presented to and approved by the Secretary of the Interior in addition to the requirements of the act approved June twenty-third, nineteen hundred and ten, entitled “An Act to amend an Act entitled ‘An Act to regulate the construction of dams across navigable waters,’ approved June twenty-first nineteen hundred and six,” and in approving the plans and specifications, the Secretary of the Interior may impose such conditions as to him shall seem proper for the protection of the public interests of Indians and the United States.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 15, 1911.

Feb. 15, 1911.
[H. R. 31927.]
[Public, No. 375.]

CHAP. 80.—An Act Authorizing the town of Blackberry to construct a bridge across the Mississippi River in Itasca County, Minnesota.

Mississippi River.
Blackberry, Minn., may bridge.
Location.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to the town of Blackberry, a municipal corporation organized and existing under and pursuant to the laws of the State of Minnesota, to build a public highway bridge across the Mississippi River at a point suitable to the interests of navigation from a point on the northerly bank of said river in lot six, section eight, township fifty-four, range twenty-four west, fourth principal meridian, to a point on the southerly bank of said river in lot nine of said section, all in the county of Itasca, State of Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 15, 1911.

Feb. 18, 1911.
[H. R. 30571.]
[Public, No. 392.]

CHAP. 117.—An Act Permitting the building of a dam across Rock River at Lyndon, Illinois.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Edward A. Smith and Harvey S. Green, of Morrison, Illinois, their heirs, administrators, executors, successors, and assigns, are hereby authorized to construct, maintain, and operate a dam across Rock River at a point suitable to the interests of navigation at or near Lyndon, Whitside County, Illinois, the south end of said dam to be located near the line between sections twenty-one and twenty-two in township twenty north, range five east, fourth principal meridian, and the north end of said dam to intersect the bank of said river in section twenty-one in the same township, range, and meridian, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Rock River.
Edward A. Smith and Harvey S. Green may dam, at Lyndon, Ill.

Vol. 34, p. 386.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 18, 1911.

Feb. 18, 1911.
[H. R. 31662.]
[Public, No. 393.]

CHAP. 118.—An Act Granting five years' extension of time to Charles H. Cornell, his assigns, assignees, successors, and grantees, in which to construct a dam across the Niobrara River, on the Fort Niobrara Military Reservation, and to construct electric light and power wires and telephone line and trolly or electric railway, with telegraph and telephone lines, across said reservation.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time given Charles H. Cornell, his assigns,

Niobrara River.

Time extended for damming, etc., on Fort Niobrara Military Reservation, Nebr.
Vol. 34, p. 297, amended.

Right of way.

Proviso.
Revocation of privileges.

assignees, successors, and grantees, by an Act of Congress entitled "An Act to grant to Charles H. Cornell, his assigns and successors, the right to abut a dam across the Niobrara River on the Fort Niobrara Military Reservation, Nebraska, and to construct and operate a trolley or electric railway line and telegraph and telephone lines across said reservation," approved June eighteenth, nineteen hundred and six, in which to construct and to put into operation such dam, and to construct and suspend wires across the said Fort Niobrara Military Reservation for the purpose of transmitting electric light and power, and to complete the construction of telegraph wires across said military reservation; also, the time in which to complete the construction and commence the operation of the trolley or electric railway, with telegraph and telephone lines, over said Fort Niobrara Military Reservation, be, and the same is hereby, extended for five years from the date of the approval of this act: *Provided*, That the privileges granted in said Act may be revoked by order of the Secretary of War, in the event of which, on the further order of the Secretary of War so to do, any or all of the constructions of any kind, improvement, fixtures, or appurtenances, shall be removed by the owner of the same at his or its own expense and cost, and without any claim of any kind from the United States.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 18, 1911.

Feb. 18, 1911.
[H. R. 31860.]
[Public, No. 394.]

CHAP. 119.—An Act Permitting the building of a wagon and trolley-car bridge across the Saint Croix River between the States of Wisconsin and Minnesota.

St. Croix River.
H. L. North et al. may bridge, St. Croix County, Wis.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to H. L. North, W. E. Webster, and H. J. Anderson, of Hudson, Wisconsin, and their heirs, personal representatives, and assigns, to build a wagon and trolley-car bridge across the Saint Croix River, also known and designated as Lake Saint Croix, from a point suitable to the interests of navigation on the east bank of said river between the north line of section twenty-five of township twenty-nine north, range twenty west, and the east and west quarter line of said section, in Saint Croix County, Wisconsin, to a point on the west bank of said river almost due west from the place of beginning, in Washington County, Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 18, 1911.

CHAP. 120.—An Act To authorize the Virginia Iron, Coal and Coke Company to build a dam across the New River near Foster Falls, Wythe County, Virginia.

Feb. 18, 1911.
[H. R. 31022.]
[Public, No. 395.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Virginia Iron, Coal and Coke Company, a corporation organized under the laws of the State of Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the New River, at a point suitable to the interests of navigation, at a point near Foster Falls, Wythe County, in the State of Virginia, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

New River.
Virginia Iron, Coal & Coke Co. may dam, near Foster Falls, Va.
Vol. 34, p. 386.

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 18, 1911.

CHAP. 121.—An Act Authorizing the building of a dam across the Savannah River at Cherokee Shoals.

Feb. 18, 1911.
[H. R. 31925.]
[Public, No. 396.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Hugh MacRae, M. F. H. Gouverneur, and E. W. Van C. Lucas, partners trading under the firm name of Hugh MacRae and Company, bankers, of the city of Wilmington, North Carolina, and their assigns, are hereby authorized to construct and maintain a dam across the Savannah River, at a point suitable to the interests of navigation, extending from a point in Elbert County, Georgia, to a point in Abbeville County, South Carolina, upon or in the vicinity of Cherokee Shoals, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Savannah River.
Hugh MacRae & Co. may dam, at Cherokee Shoals, Ga.
Vol. 34, p. 386.

Sec. 2. That the right to alter, amend, or repeal this act is hereby expressly reserved.

Amendment.

Sec. 3. That the Act of Congress approved March second, nineteen hundred and seven, entitled "An Act permitting the building of a dam across the Savannah River at Cherokee Shoals by the Hugh MacRae Company, a corporation organized under the laws of South Carolina," is hereby repealed.

Former law repealed.
Vol. 34, p. 1255.

Approved, February 18, 1911.

Feb. 18, 1911.
[H. R. 31926.]

[Public, No. 397.]

CHAP. 122.—An Act Permitting the building of a dam across Rock River near Byron, Illinois.

Rock River.
Byron Water Power Co. may dam, near Byron, Ill.

Vol. 34, p. 386.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Byron Water Power Company, a corporation organized under the laws of the State of Illinois, with its principal office at Byron, Illinois, its successors and assigns, is hereby authorized to construct and maintain a dam across Rock River, at a point suitable to the interests of navigation, near the upper end of an island in said river at or near the north line of the south half of the southeast quarter of section twenty, township twenty-five north, range eleven east, of the fourth principal meridian, in Ogle County, Illinois, and all works incident thereto in the utilization of the power thereby developed, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 18, 1911.

Feb. 18, 1911.
[H. R. 31931.]

[Public, No. 398.]

CHAP. 123.—An Act Authorizing the Ivanhoe Furnace Corporation, of Ivanhoe, Wythe County, Virginia, to erect a dam across New River.

New River.
Ivanhoe Furnace Corporation may dam, at Ivanhoe, Va.

Vol. 34, p. 386.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Ivanhoe Furnace Corporation, of Ivanhoe, Wythe County, Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across New River, at a point suitable to the interests of navigation, at Ivanhoe, Wythe County, Virginia, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the contruction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 18, 1911.

Feb. 20, 1911.
[H. R. 20375.]

[Public, No. 404.]

CHAP. 134.—An Act To authorize certain changes in the permanent system of highways, District of Columbia.

Dist. Columbia.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Commissioners of the District of Columbia are hereby authorized to prepare a new highway plan for that triangular portion of the District of Columbia lying north of Rittenhouse street, west of Thirty-third street, and southeast of the District line, under the provisions contained in the Act of Congress approved March second, eighteen and ninety-three, entitled "An Act to provide a permanent system of highways in that part of the District of Columbia lying outside of cities," and an amendment to said Act approved June twenty-eighth, eighteen hundred and ninety-eight; that upon the completion and recording of said new highway plan it shall take the place of and stand for any previous plan for said portion of the District of Columbia.

New highway plan for northwest section.
Vol. 27, p. 532.
Vol. 30, pp. 5, 9.

Approved, February 20, 1911.

CHAP. 135.—An Act To authorize the extension of Thirteenth Street northwest from its present terminus north of Madison Street to Piney Branch Road.

Feb. 20, 1911.
[H. R. 22688.]
[Public, No. 405.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That under and in accordance with the provisions of subchapter one of chapter fifteen of the Code of Law for the District of Columbia, within six months after the passage of this Act the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to institute in the Supreme Court of the District of Columbia a proceeding in rem to condemn the land that may be necessary for the opening of Thirteenth street northwest from its terminus north of Madison street to Piney Branch road, with a width of one hundred and ten feet, according to the plan for a permanent system of highways in the District of Columbia: *Provided, however*, That the entire amount found to be due and awarded by the jury in said proceeding as damages, for and in respect of the land to be condemned for said extension, plus the costs and expenses of said proceeding, shall be assessed by the jury as benefits.

Dist. Columbia.
Thirteenth Street NW.
Condemning land for extending.
Vol. 34, p. 151.
Proviso.
Damages assessed as benefits.

Sec. 2. That there is hereby appropriated out of the revenues of the District of Columbia an amount sufficient to pay the necessary costs and expenses of the said condemnation proceedings taken pursuant hereto, and for the payment of the amounts awarded as damages, to be repaid to the District of Columbia from the assessments for benefits and covered into the Treasury to the credit of the revenues of the District of Columbia.

Appropriations for expenses, etc.
Payment of awards.

Approved, February 20, 1911.

Feb. 24, 1911.
[S. 574.]

[Public, No. 412.]

CHAP. 150.—An Act To authorize J. W. Vance, L. L. Allen, C. F. Helwig, and H. V. Worley, of Pierce City, Missouri; A. B. Durnil, D. H. Kemp, Sig Soloman, J. J. Davis, S. A. Chappell, and W. M. West, of Monett, Missouri; M. L. Coleman, M. T. Davis, Jared R. Woodfill, junior, J. H. Jarrett, and William H. Standish, of Aurora, Lawrence County, Missouri; and L. S. Meyer, F. S. Heffernan, Robert A. Moore, William H. Johnson, J. P. McCammon, M. W. Colbaugh, and W. H. Schreiber, of Springfield, Greene County, Missouri, to construct a dam across the James River, in Stone County, Missouri, and to divert a portion of its waters through a tunnel into the said river again to create electric power.

James River. J. W. Vance and others may dam, in Big Bend of.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That J. W. Vance, L. L. Allen, C. F. Helwig, and H. V. Worley, of Pierce City, Missouri; A. B. Durnil, D. H. Kemp, Sig Soloman, J. J. Davis, S. A. Chappell, and W. M. West, of Monett, Missouri; M. L. Coleman, M. T. Davis, Jared R. Woodfill, junior, J. H. Jarrett, and William H. Standish, of Aurora, Lawrence County, Missouri; and L. S. Meyer, F. S. Heffernan, Robert A. Moore, William H. Johnson, J. P. McCammon, M. W. Colbaugh, and W. H. Schreiber, of Springfield, Greene County, Missouri, their heirs and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam in the Big Bend of the James River, in section twenty-two, township twenty-three north, range twenty-four west, in the county of Stone and State of Missouri, across the said James River at said point, and to impound thereat in what is known as the Lower Narrows of the Big Bend of the said James River the waters of said river, and by canal and tunnel to divert and conduct across said narrows such portion of the water of said river, through said tunnel into said river again, as may be necessary for electric-power purposes. The construction, maintenance, and operation of the dam herein authorized, as well as the determination of the rights and obligations under the permission granted hereby, shall be in all respects in accordance with and subject to the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Construction, etc.

Vol. 34, p. 386.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act in whole or in part is hereby expressly reserved.

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10011.]

[Public, No. 414.]

CHAP. 152.—An Act For establishing a light and fog-signal station on the San Pedro breakwater, California.

San Pedro Breakwater, Cal.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce and Labor be, and he is hereby, authorized to establish a light and fog-signal station on the San Pedro breakwater, California, at a cost not to exceed thirty-six thousand dollars.

Light, etc., station authorized on.

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10404.]
[Public, No. 415.]

CHAP. 153.—An Act To authorize the Secretary of War to grant a right of way through lands of the United States to the Buckhannon and Northern Railroad Company.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he is hereby, authorized, in his discretion, to grant the Buckhannon and Northern Railroad Company a right of way through lands of the United States, on the western bank of the Monongahela River, in the State of West Virginia, adjacent to locks numbered ten, eleven, twelve, thirteen, and fourteen, at such price, and on such terms and conditions, as he may consider just, equitable, and expedient.

Monongahela River.
Buckhannon & Northern R. R. Co. granted right of way across lands of locks on.

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10431.]
[Public, No. 416.]

CHAP. 154.—An Act To authorize the Argenta Railway Company to construct a bridge across the Arkansas River between the cities of Little Rock and Argenta, Arkansas.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Argenta Railway Company, a corporation organized under the laws of the State of Arkansas, its successors and assigns, be, and it is hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Arkansas River from a point in the city of Little Rock, Arkansas, suitable to the interests of navigation, to some point in the city of Argenta, on the north bank of said river, in the county of Pulaski, State of Arkansas, said bridge to be for the purpose of the passage of the street-car traffic carried on by said company or under its authority, and also, at the option of said company, its successors and assigns, to be used for the passage of wagons, vehicles, interurban cars, animals, and persons on foot and in vehicles, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six, except as to section three of said Act.

Arkansas River.
Argenta Ry. Co. may bridge, Little Rock to Argenta, Ark.

Vol. 34, p. 84.

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10596.]

[Public, No. 418.]

CHAP. 156.—An Act To authorize the Rainy River Improvement Company to construct a dam across the outlet of Namakan Lake at Kettle Falls, in Saint Louis County, Minnesota.

Namakan Lake.
Rainy River Improvement Co. may dam, at Kettle Falls, Minn.
Vol. 34, p. 386.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Rainy River Improvement Company, a corporation organized under the laws of the State of Minnesota, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a dam across the outlet of Lake Namakan at Kettle Falls, in Saint Louis County, Minnesota, at a point suitable to the interests of navigation, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10690.]

[Public, No. 419.]

CHAP. 157.—An Act Providing for aids to navigation along the Livingstone Channel, Detroit River, Michigan.

Detroit River.
Aids to navigation authorized along Livingstone Channel.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of Commerce and Labor be, and he is hereby, authorized to establish and provide such lights and buoys as may, in his judgment, be necessary to properly mark the Livingstone Channel in the Detroit River, Michigan, at an expense not to exceed two hundred and ten thousand dollars.

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10757.]

[Public, No. 420.]

CHAP. 158.—An Act To amend an act entitled "An act permitting the building of a dam across the Mississippi River at or near the village of Sauk Rapids, Benton County, Minnesota," approved February twenty-sixth, nineteen hundred and four.

Mississippi River.
Time extended for damming at Sauk Rapids, Minn.
Vol. 33, p. 53, amended.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section three of an Act entitled "An Act permitting the building of a dam across the Mississippi River at or near the village of Sauk Rapids, Benton County, Minnesota," approved February twenty-sixth, nineteen hundred and four, be, and the same is hereby, amended so as to read as follows:

Time of construction.
Vol. 34, p. 1058.
Ante, p. 3057.

"SEC. 3. That this Act shall be null and void and all rights acquired under the same forfeited unless the construction of the dam herein authorized be commenced on or before the first day of July, anno Domini nineteen hundred and eleven, and such construction continued with and the dam completed within two years from the date last mentioned."

Approved, February 24, 1911.

Feb. 24, 1911.
[S. 10836.]
[Public, No. 421.]

CHAP. 159.—An Act To authorize the Minnesota River Improvement and Power Company to construct dams across the Minnesota River.

Minnesota River.

Minnesota River Improvement & Power Co. may dam.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Minnesota River Improvement and Power Company, a corporation organized under the laws of the State of Minnesota, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate dams across the Minnesota River at points suitable to the interests of navigation, as follows:

At outlet of Lake Bigstone.

First. One at or near the outlet of Lake Bigstone, in the counties of Bigstone and Lac qui Parle, Minnesota, and the county of Grant, South Dakota, and in that connection to divert the waters of the Whetstone River into Bigstone Lake.

Confluence with Redwood River.

Second. One at or near the confluence of the Redwood and Minnesota Rivers between the counties of Renville and Redwood, in said State.

Construction, etc.

Vol. 34, p. 386.

Each of said dams are to be constructed, maintained, and operated in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Amendment.

Sec. 2. That the right to alter, amend, or repeal this Act is herby expressly reserved.

Approved, February 24, 1911.

Feb. 27, 1911.
[H. R. 26150.]
[Public, No. 424.]

CHAP. 165.—An Act To authorize the construction of drawless bridges across a certain portion of the Charles River in the State of Massachusetts.

Charles River.

Bridges authorized across between Cambridge and Boston, Mass.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Metropolitan Park Commission, or any town or city, or any other public body authorized by the State of Massachusetts, all or any of them, be, and they hereby are, authorized to construct, at any time hereafter, drawless bridges across the Charles River in the State of Massachusetts connecting River Street in Cambridge and Cambridge Street in the Brighton district, so called, of Boston, and at any other points upon said river, at, near,

Provisos.
Height, etc.
Compensation to owners of abutting property.
Commission to assess damages.
Construction.
Vol. 34, p. 84.

or above said Cambridge and River Streets: *Provided*, That said bridges shall be at least twelve feet above the ordinary level of the water in the basin over the main ship channel, and the piers and other obstructions to the flow of the river shall be constructed in such form and in such places as the Secretary of War shall approve: *Provided further*, That before the construction of said bridges or any of them is begun, the State of Massachusetts shall by legislative enactment provide for adequate compensation for the owner, owners, lessee or lessees of property abutting on said river above any of the said bridges, for damages if any caused to said property or leasehold interests therein by reason of interference with the access by water to said property, due to the construction of bridges without draws: *Provided further*, That said legislative enactment shall provide for the appointment of three commissioners to hear the parties in interest and assess the damages to said property; their decision as to the amount of damages and questions of fact to be final; said commissioners to be appointed by the Supreme Judicial Court of Massachusetts. Except as inconsistent herewith, this Act shall be subject to the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1911.

Feb. 27, 1911.
[H. R. 28632.]
[Public, No. 425.]

CHAP. 166.—An Act Making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes.

Rivers and harbors appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums of money be, and are hereby, appropriated, to be paid out of any money in the Treasury not otherwise appropriated, to be immediately available, and to be expended under the direction of the Secretary of War and the supervision of the Chief of Engineers for the construction, completion, repair, and preservation of the public works hereinafter named:

Bar Harbor, Me.
Breakwater.
Proviso.
Contracts.

Breakwater from Mount Desert to Porcupine Island, Bar Harbor, Maine: Continuing construction, thirty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and forty-five thousand two hundred dollars, exclusive of the amounts herein and heretofore appropriated.

Pepperells Cove, Me.

Improving Pepperells Cove, Maine: Continuing improvement, thirty-five thousand dollars.

Saco River, Me.

Improving Saco River, Maine: Completing improvement, twenty-five thousand dollars.

Exeter River, N. H.

Improving Exeter River, New Hampshire: Completing improvement in accordance with the report submitted in House Document Numbered One thousand and ninety, Sixty-first Congress, third session, nine thousand two hundred dollars.

Burlington, Vt.

Improving harbor at Burlington, Vermont: For maintenance and repair of breakwater, two thousand five hundred dollars.

Gloucester, Mass.

Improving harbor at Gloucester, Massachusetts: For maintenance, fifteen thousand dollars.

Nantucket, Mass.

Improving harbor at Nantucket, Massachusetts: Continuing improvement and for maintenance, twenty thousand dollars.

New Bedford and Fairhaven, Mass.
Proviso.
Contracts.

Improving harbors at New Bedford and Fairhaven, Massachusetts: Continuing improvement, fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and twenty-seven thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Sandy Bay, Cape Ann, Mass.

Harbor of refuge at Sandy Bay, Cape Ann, Massachusetts: Continuing improvement, one hundred thousand dollars.

Mystic and Malden Rivers, Mass.

Improving Mystic and Malden Rivers, Massachusetts: For maintenance, ten thousand dollars.

Taunton River, Mass.

Improving Taunton River, Massachusetts: For maintenance, five thousand dollars.

Weymouth Fore River, Mass.

Improving Weymouth Fore River, Massachusetts: Completing improvement below the Quincy Point Bridge in accordance with report submitted in House Document Numbered Thirteen hundred and thirty-four, Sixty-first Congress, third session, one hundred and forty thousand dollars.

Block Island, R. I.
Harbor of refuge.

Improving harbor of refuge at Block Island, Rhode Island: For maintenance, twelve thousand five hundred dollars.

Point Judith, R. I.
Harbor of refuge.
Proviso.
Contracts.

Harbor of refuge at Point Judith, Rhode Island: Continuing improvement and for maintenance, fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate four hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Pawtucket River, R. I.

Improving Pawtucket River, Rhode Island: For maintenance, five thousand dollars.

Duck Island, Conn.
Harbor of refuge.

Harbor of refuge at Duck Island, Connecticut: Continuing improvement, one hundred thousand dollars:

Proviso. Contracts.

Provided, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and ninety thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Fivemile River and Greenwich, Conn.

Improving harbors at Fivemile River and Greenwich, Connecticut: For maintenance, three thousand five hundred dollars.

Connecticut River, Conn., below Hartford.

Proviso. Contracts.

Improving Connecticut River, Connecticut, below Hartford, in accordance with the report submitted in House Document Numbered Twelve hundred and ninety-four, Sixty-first Congress, third session, seventy-seven thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred thousand dollars, exclusive of the amount herein appropriated.

New Haven, Conn. Breakwater.

Breakwater at New Haven, Connecticut: Completing construction, thirty-five thousand dollars.

Black Rock Harbor, N. Y.

Provisos. Contracts.

Bird Island Pier. Use by Buffalo as park, granted.

Improving Black Rock Harbor, New York: Continuing improvement, four hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated. The Secretary of War is hereby authorized to grant to the city of Buffalo, New York, the right and privilege of occupying, improving, and using, for the purpose of establishing a public park and landing facilities, that part of the structure known as "Bird Island Pier," on Niagara River, lying north of Albany Street extended in said city and forming a part of the Black Rock Harbor improvement, and the lands of the United States under water along both sides of said pier to the established harbor lines, on such terms, conditions, and stipulations as he may deem expedient and equitable and necessary for the protection of all the interests of the United States in and to said premises: *Provided*, That in the opinion of the Attorney General of the United States the granting of such right and privilege is permissible under the terms of the grant from the State of New York by which said premises are holden: *Provided further*, That in case the Attorney General shall be of the opinion that the granting of the said right and privilege is not permissible under the terms of the aforesaid grant, the said right and privilege shall not be granted by the Secretary of War until the city of Buffalo shall

Condition.

Consent of New York.

have secured the sanction and consent of the State of New York through its constituted agencies.

Buffalo, N. Y. Stony Point breakwater.

Improving harbor at Buffalo, New York: The Secretary of War is hereby authorized to apply from appropriations heretofore made for repairing and rebuilding breakwaters and for maintenance of structures fifteen thousand dollars, or so much thereof as may be necessary, to the completion of the Stony Point Breakwater.

Charlotte, N. Y.

Improving harbor at Charlotte, New York: For maintenance, fifty thousand dollars.

Great Sodus Bay, N. Y.

Improving harbor at Great Sodus Bay, New York: For maintenance, thirty thousand dollars.

Hempstead, N. Y.
Proviso.
Restriction.

Improving Hempstead Harbor, New York: Completing improvement, twenty-three thousand five hundred dollars: *Provided*, That no part of this sum shall be expended upon the channel above the town wharf until a suitable dumping ground for the material dredged shall have been furnished by the local interests free of cost.

Little Sodus Bay, N. Y.

Improving harbor at Little Sodus Bay, New York: For maintenance, thirty thousand dollars.

Ambrose Channel, N. Y.

Improving New York Harbor, New York: For maintenance, including Ambrose Channel, one hundred thousand dollars.

Oswego, N. Y.

Improving harbor at Oswego, New York: Continuing improvement in accordance with plan A and for maintenance, eighty-five thousand dollars.

Rondout and Peekskill, N. Y.

Improving harbors at Rondout and Peekskill, New York: For maintenance, six thousand dollars.

East Chester Creek, N. Y.

Improving East Chester Creek, New York: Continuing improvement and for maintenance, ten thousand dollars.

East River and Hell Gate, N. Y.

Removing obstructions in East River and Hell Gate, New York: Continuing improvement, including work at the Middle Ground and in the channel between North Brother and South Brother Islands, two hundred thousand dollars.

Harlem River, N. Y.

Improving Harlem River, New York: Continuing improvement, seventy-five thousand dollars.

Hudson River, N. Y.

Improving Hudson River, New York: Continuing improvement and for maintenance, seven hundred and fifty thousand dollars.

Newtown Creek, N. Y.

Improving Newtown Creek, New York: For maintenance, twenty thousand dollars.

Westchester Creek, N. Y.

Improving Westchester Creek, New York: Completing improvement, thirty-two thousand seven hundred and eighty dollars.

Arthur Kill, N. Y. and N. J.

Improving Arthur Kill, New York and New Jersey: For maintenance of improvement of Arthur Kill and the waters connecting Raritan Bay with New York Harbor, including channel between Staten Island and the New Jersey shore, New York and New Jersey, ten thousand dollars.

Keyport Harbor, etc., N. J.

Improving Keyport Harbor, Matawan Creek, Raritan and South Rivers, Shoal Harbor and Compton Creek, and Cheesequake Creek, New Jersey: For maintenance, thirty thousand five hundred dollars.

Raritan Bay, N. J.

Improving Raritan Bay, New Jersey: For maintenance, twenty thousand dollars.

Alloway Creek, N. J.

Improving Alloway Creek, New Jersey: For maintenance, five thousand dollars.

Cooper Creek, N. J.

Improving Cooper Creek, New Jersey: For maintenance, five thousand dollars.

Mantua Creek, N. J.

Improving Mantua Creek, New Jersey: For maintenance, six thousand dollars.

Passaic River, N. J.

Provisos. Widening channels.

Limit of cost.

Improving Passaic River, New Jersey: For maintenance of improvement above the Montclair and Greenwood Lake Railroad bridge, five thousand dollars: *Provided*, That the project for improvement below said bridge may, in the discretion of the Secretary of War, be so modified as to allow the widening of the channel of the river at bends wherever considered desirable in the interest of commerce and navigation: *Provided*, *further*, That no additional work shall be done under this authority which will increase the total cost of the project given in report submitted in House Document Numbered Four hundred and forty-one, Fifty-ninth Congress, second session.

Raccoon Creek, N. J.

Improving Raccoon Creek, New Jersey: For maintenance, five thousand dollars.

Salem River, N. J.

Improving Salem River, New Jersey: Completing improvement and for maintenance, ten thousand six hundred dollars.

Shrewsbury River, N. J.

Improving Shrewsbury River, New Jersey: For maintenance, ten thousand dollars.

Tuckerton Creek, N. J.

Improving Tuckerton Creek, New Jersey: Completing improvement and for maintenance, twenty-three thousand three hundred and eighty dollars.

Woodbridge Creek, N. J.

Improving Woodbridge Creek, New Jersey: For maintenance, three thousand dollars.

Delaware River. Philadelphia to the sea.

Proviso. Contracts.

Improving Delaware River, Pennsylvania, New Jersey, and Delaware: Continuing improvement and for maintenance from Allegheny Avenue, Philadelphia, to the sea, eight hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Erie, Pa.

Improving harbor at Erie, Pennsylvania: For maintenance, thirty thousand dollars.

Pittsburg, Pa.

Improving harbor at Pittsburg, Pennsylvania: For maintenance, five thousand dollars.

Delaware Bay, Del. Harbor of refuge.

Improving harbor of refuge, Delaware Bay, Delaware: For maintenance, eight thousand dollars.

Pier at Lewes, Del.

Constructing pier in Delaware Bay near Lewes, Delaware: For maintenance, one thousand dollars.

Wilmington, Del.

Proviso.

Reexamination.

Improving harbor at Wilmington, Delaware: For restoration and maintenance, one hundred thousand dollars: *Provided*, That a reexamination of the harbor shall be made with a view to determining a method by which an improvement adequate for the needs of commerce can be maintained at less cost.

Appoquinimink, etc., Rivers, Del.

Improving Appoquinimink, Murderkill, and Mispillion Rivers, Delaware: Continuing improvement and for maintenance in accordance with the existing approved projects, fifteen thousand dollars.

Broad Creek River, Del.

Improving Broad Creek River, Delaware: For maintenance, two thousand dollars.

Broadkill River, Del.

Improving Broadkill River, Delaware: For maintenance, ten thousand dollars.

Saint Jones River, Del.

Proviso.

Title to cut-offs, etc.

Improving Saint Jones River, Delaware: Continuing improvement and for maintenance, eleven thousand seven hundred dollars: *Provided*, That no part of said amount shall be expended, except for maintenance, until a satisfactory title to the land required for the necessary cut-offs shall have been transferred to the United States free of cost and the United States shall have been released from all claims for damages arising from the proposed diversion of the stream.

Smyrna River, Del.

Proviso.

Title to cut-offs, etc.

Improving Smyrna River, Delaware: Continuing improvement, fifteen thousand dollars: *Provided*, That no part of said amount shall be expended until satisfactory title to the land required for the necessary cut-offs shall have been transferred to the United States free of cost.

Baltimore, Md.

Maintenance, widening channel.

Improving harbor at Baltimore, Maryland: For maintenance of improvement of harbor of Southwest Baltimore, ten thousand dollars; for maintenance of improvement of channel of Curtis Bay, Baltimore Harbor, five thousand dollars. The unexpended balance of appropriations heretofore made for Patapsco River and channel to Baltimore is hereby made available for securing increased width of channel at the entrances and in the bends as well as for maintenance.

Chesapeake Bay, Md.

Eastern shore harbors, etc.

Improving harbors at Rockhall, Queenstown, Claiborne, and Cambridge, and Chester, Choptank, Warwick, Wicomico, Pocomoke, La Trappe, and Manokin Rivers, and Tyaskin Creek, Maryland: For maintenance, thirty-three thousand dollars.

Nanticoke River, Del. and Md.

Improving Nanticoke River, Delaware and Maryland: For maintenance of improvement of Nanticoke River and completing improvement of Northwest Fork of Nanticoke River (Marshyhope Creek), Maryland, thirty-six thousand dollars.

Susquehanna River.

Havre de Grace, Md.

Improving Susquehanna River above and below Havre de Grace, Maryland: Completing improvement, thirty-four thousand five hundred dollars.

Anacostia River, D. C.

Improving Anacostia River, District of Columbia: Continuing improvement and for maintenance, two hundred thousand dollars.

Potomac River. Washington, D. C.

Improving Potomac River: Continuing improvement and for maintenance at Washington, District of Columbia, sixty thousand dollars.

Alexandria, Va.

Improving Potomac River at Alexandria, Virginia: Completing improvement, fifty-six thousand dollars.

Milford Haven, Va.

Improving harbor at Milford Haven, Virginia: For maintenance, two thousand five hundred dollars.

Norfolk, Va. Maintenance.

Improving harbor at Norfolk, Virginia: For maintenance of improvement, including Western Branch of Elizabeth River, five thousand dollars.

Channel to Newport News, etc.

Proviso. Contracts.

Improving Norfolk Harbor and the approaches thereto, and the channel to Newport News, Virginia: Continuing improvement, four hundred and twenty-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate six hundred and twenty-two thousand five hundred dollars, exclusive of the amounts herein and heretofore appropriated.

James River, Va.

Improving James River, Virginia: Continuing improvement and for maintenance, one hundred and fifty thousand dollars.

Nansemond River, Va.

Improving Nansemond River, Virginia: For maintenance, three thousand dollars.

Nomini Creek, Va.

Improving Nomini Creek, Virginia: Completing improvement and for maintenance, eight thousand dollars.

Upper Machodoc Creek, Va.

Improving Upper Machodoc Creek, Virginia: Completing improvement, thirteen thousand two hundred dollars.

Urbana Creek, Va.

Improving Urbana Creek, Virginia: Completing improvement and for maintenance, ten thousand dollars.

Mattaponi and Pamunkey Rivers, Va.

Improving Mattaponi and Pamunkey Rivers, Virginia: Continuing improvement and for maintenance, ten thousand dollars.

Waterway, Norfolk to Albemarle Sound.

Improving waterway from Norfolk Harbor, Virginia, to Albemarle Sound, North Carolina: For maintenance of improvement of inland water route from Norfolk, Virginia, to Albemarle Sound, North Carolina, through Currituck Sound, two thousand dollars.

Beaufort, N. C.

Improving harbor at Beaufort, North Carolina: For maintenance, five thousand dollars.

Cape Fear River, N. C. Below Wilmington.

Proviso. Clearing channel.

Improving Cape Fear River at and below Wilmington, North Carolina: Continuing improvement to such depth in excess of twenty feet as the appropriations for the work may permit, due regard being given to the difference in tidal oscillation at the upper and lower portion of the improvement, one hundred thousand dollars: *Provided*, That not exceeding one thousand dollars thereof may be used for clearing to a depth of ten feet the channel or cut between the main channel of the river and the Carolina beach pier.

Contentnia Creek, N. C.

Improving Contentia Creek, North Carolina: For maintenance, one thousand dollars.

Neuse and Trent Rivers, N. C.

Improving Neuse and Trent Rivers, North Carolina: For maintenance, five thousand dollars.

New River, and waterways to Beaufort, N. C.

Improving New River, and waterways to Beaufort, North Carolina: For maintenance of improvement of New River, North Carolina, including inland waterways between Beaufort Harbor and New River and between New River and Swansboro, five thousand dollars.

Northeast, etc., Rivers, N. C.

Improving Northeast, Black, and Cape Fear Rivers, North Carolina: For maintenance of improvement of Northeast and Black Rivers and Cape Fear River above Wilmington, North Carolina, three thousand five hundred dollars.

Pamlico and Tar Rivers, N. C.

Improving Pamlico and Tar Rivers, North Carolina: For maintenance, five thousand dollars.

Charleston, S. C.

Improving harbor at Charleston, South Carolina: Continuing improvement, one hundred thousand dollars.

Winyah Bay, S. C.

Contracts.

Improving Winyah Bay, South Carolina: The Secretary of War is hereby authorized to enter into a contract or contracts for such materials and work as may be required for the prosecution of this improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred thousand dollars, exclusive of the amounts heretofore appropriated.

Mingo Creek, S. C.

Improving Mingo Creek, South Carolina: For maintenance, one thousand dollars.

Santee and Congaree Rivers, S. C.

Improving Santee and Congaree Rivers, South Carolina: For maintenance of improvement, including the Estherville-Minim Creek Canal and the Congaree River as far up as the Gervais Street Bridge, Columbia, forty-seven thousand dollars.

Waterways, Charleston and Alligator Creek, S. C.

Improving waterways between Charleston and Alligator Creek, South Carolina: Completing improvement of inland waterways between Charleston Harbor and McClellanville, including branch to Morrisons Landing, forty-one thousand dollars.

Brunswick, Ga.

Improving harbor at Brunswick, Georgia: Continuing improvement and for maintenance, sixty thousand dollars.

Sapelo, Ga.

Improving Sapelo Harbor, Georgia: Completing improvement, eleven thousand dollars.

Savannah, Ga.

Improving harbor at Savannah, Georgia: Continuing improvement, four hundred thousand dollars.

Altamaha, etc., Rivers, Ga.

Improving Altamaha, Oconee, and Ocmulgee Rivers, Georgia: For maintenance, thirty thousand dollars.

Flint River, Ga.

Improving Flint River, Georgia: Continuing improvement and for maintenance, seven thousand five hundred dollars.

Savannah River, Ga.

Improving Savannah River, Georgia: Continuing improvement and for maintenance below Augusta, one hundred thousand dollars.

Chattahoochee River, Ga. and Ala.

Improving Chattahoochee River, Georgia and Alabama: Continuing improvement below Columbus, Georgia, and for maintenance, seventy-five thousand dollars.

Coosa River, Ga. and Ala.
Mayos Bar.

Improving Coosa River, Georgia and Alabama: Continuing improvement by the completion of lock and dam at Mayos Bar, near Rome, Georgia, one hundred and twenty-one thousand and thirty-nine dollars.

Dams Nos. 4 and 5.

Improving Coosa River, Georgia and Alabama: Continuing improvement by the construction of a lock in Dam Numbered Four, and by the construction of Dam Numbered Five, in the State of Alabama, one hundred and fifty thousand dollars.

Ragland Water Power Co.
May complete dam, etc., at Lock No. 4.
Provisos.
To bear all expense.
Navigation, etc., interests protected.
Time of construction, etc.
Water power franchise granted.
Approval of plans.

The Secretary of War is hereby authorized and empowered to enter into contract with the Ragland Water Power Company, its successors or assigns, hereinafter designated "the contracting party," to complete the dam heretofore partially constructed by the Government at Lock Numbered Four on the Coosa River, the work to be done under his supervision and control, and in accordance with the present adopted project and any modification thereof that he may deem proper: *Provided*, That the contracting party shall furnish all materials, of every character, and pay for all labor required in the construction of said dam, which, upon completion, shall become the property of the United States, free of all costs, claims, or charges of any kind whatsoever: *Provided further*, That the terms of this Act and any stipulation which the Secretary of War may deem necessary to safeguard the interests of navigation and other interests of the United States shall be embodied in any contract entered into as aforesaid. The contracting party shall begin the said work within one year from the approval of this Act, and shall complete the same within three years from the date of commencing construction; otherwise the authorization hereby conferred shall be void and the rights hereby conferred shall cease and be determined, the Government reserving the right to commence and finish the work, if deemed advisable, at any time before it is commenced by the contracting party; or, if begun and not carried out in strict conformity to the directions of the Secretary of War, the Government may assume the completion of said work at its option, the cost of such completion to be paid by the contracting party: *Provided*, That the Secretary of War shall determine from time to time whether the work is being properly done. In consideration of the completion of said dam free of cost to the Government, the contracting party is hereby granted such rights as the Government possesses to use the water power produced by said dam for manufacturing and other industrial purposes for a period of fifty years: *Provided*, That the plans for the necessary works and structures to utilize said water power shall be approved by the Secretary of War: *Provided further*, That the right is reserved to the United States to construct, maintain, and operate a forebay and lock for navigation purposes in connection with said dam, and nothing shall be done in the use of the water from said dam or otherwise to interfere with or in any way impede or retard the operation of said lock or the proper and complete navigation of the river at all times, nor in any way to interfere with the use and control of the same by the United States or the maintenance of the water surface above the dam at the established pool level; and the Secretary of War is hereby authorized to prescribe regulations to govern the use of the said water power and the operations of the plant and force employed in connection therewith; and no claim shall be made against the United States for any failure of water power, resulting from any cause whatsoever: *Provided further*, That the contracting party shall furnish to the United States, free of cost, such electric current as may be necessary for operating the Government lock and lighting its buildings and grounds: *And provided further*, That the contracting party may have ingress and egress over Government lands in the construction and operation of the plant. The Secretary of War may require the contracting party to execute a bond, with proper securities, before the commencement of the work, in such amount as he may consider necessary, to insure the beginning, prosecution, and completion of the work and compliance with the terms and requirements of this act, and in case of failure to comply with the requirements of said bond the contracting party shall forfeit to the United States the full amount thereof: *Provided*, That a suitable force of inspectors shall be employed on the work by the Secretary of War, at the expense of the contracting party, to see that the plans and specifications and the terms and requirements of the Act and the conditions of the contract are strictly carried out. Congress reserves the right to alter, amend, or repeal the rights and privileges hereby conferred, and the United States shall incur no liability because of the alteration, amendment, or repeal thereof: *Provided*, That to insure compliance with the terms of this contract, or to protect the interests of navigation and other interests of the United States, the Secretary of War shall have power, at any time, to order a suspension of all privileges hereby granted, and a compliance with such order may be enforced by an injunction of the court of the United States exercising jurisdiction in the district in which the work is situated, and proper proceedings to this end shall be instituted by the Attorney General upon request of the Secretary of War. Nothing herein shall be construed as in any way abridging the exclusive jurisdiction and control by the United States of the Coosa River, and of any structure therein, or as repealing or modifying any of the pro-

Rights for navigation purposes reserved.

Regulations, etc.

Electric current to Government works, free of cost.

Easement.

Bond, etc.

Inspectors, etc.

Right to alter, etc.

Authority of Secretary of War.

Jurisdiction not impaired.

Raising height at dam, etc., required.

Storage basin.

Condition.

Overflow damages.

Payment for power.

Additional for increase from reservoirs.

Readjusting rate.

visions or laws now existing for the protection of navigation. The contracting party, in consideration of the privileges granted hereby, must, under such regulations as the Secretary of War may require, obligate and bind itself, its successors or assigns, to raise the height of said dam at Lock Numbered Four three feet, and shall stop the leaks above Dam Numbered Four by which water escapes under such dam, so far as the same can be done, and to keep said leaks stopped so far as it is possible so to do. In consideration of making said improvements, the said contracting party shall have the right to raise said dam during low water to such a height as may be necessary to give it a storage basin above the dam, in order that it may develop and operate a water power: *Provided*, That the said storage does not interfere with navigation: *Provided further*, That the said contracting party shall pay all damages incurred by reason of overflowed lands. Beginning with the year nineteen hundred and twenty-five, the contracting party shall pay to the United States for the power due to the natural flowage of the river the sum of one dollar per ten-hour horsepower per year: *Provided*, That in case the natural flowage of the river is increased at this point by storage reservoirs above this point, the power company shall have the right to lease, for a period not exceeding the life of this authorization, the increased power due to said storage, and shall pay on all power above that due to natural flowage of the river, as increased by local storage at Dam Numbered Four, the sum of one dollar per year for the first five years, two dollars per year for the second five years, and thereafter three dollars per year for each ten-hour horsepower sold or used, or in lieu of above payment may, in the discretion of the Secretary of War, pay its equitable share toward the construction of said reservoir or reservoirs, such share to be determined by the Secretary of War: *Provided*, That the Secretary of War, in his discretion, may readjust such rate of compensation at periods of ten years.

Waterway, Savannah, Ga., and Fernandina, Fla.

Improving waterway between Savannah, Georgia, and Fernandina, Florida: For maintenance, thirty thousand dollars.

Apalachicola Bay, Fla.

Improving Apalachicola Bay, Florida: Continuing improvement and for maintenance, including Link Channel and West Pass, five thousand dollars.

Channel, Clearwater Harbor to Tampa Bay, Fla.

Improving channel from Clearwater Harbor through Boca Ceiga Bay to Tampa Bay, Florida: Completing improvement, twenty-nine thousand five hundred dollars.

Fernandina, Fla.

Improving harbor at Fernandina, Florida: For maintenance, including the entrance channel through Cumberland Sound, Georgia and Florida, twenty-five thousand dollars.

Hillsboro Bay, Fla.

Improving Hillsboro Bay, Florida: Continuing improvement in accordance with the report submitted in House Document Numbered Six hundred and thirty-four, Sixty-first Congress, second session, and subject to the conditions recommended by the Chief of Engineers, United States Army, on page two of said document, three hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Key West, Fla.

Improving harbor at Key West, Florida: For maintenance of improvement of the northwest entrance channel, twenty-five thousand dollars.

Pensacola, Fla.

Improving harbor at Pensacola, Florida: Continuing improvement and for maintenance, twenty-five thousand dollars.

Channel, Apalachicola River, to Saint Andrews Bay, Fla.

Improving channel from Apalachicola River to Saint Andrews Bay, Florida: Continuing improvement, one hundred and fifty thousand dollars.

Tampa Bay, Fla.

Improving Tampa Bay, Florida: For maintenance, nine thousand dollars.

Apalachicola River, Fla.

Improving Apalachicola River, Florida: Continuing improvement and for maintenance, including the cut-off, Lee Slough, lower Chipola River, and upper Chipola River from Marianna to its mouth, five thousand dollars.

Caloosahatchee River, Fla.

Improving Caloosahatchee River, Florida: Completing improvement, sixty-nine thousand dollars.

Holmes River, Fla.

Improving Holmes River, Florida: For maintenance of improvement from Vernon to the mouth, one thousand dollars.

Saint Johns River, Fla.

Improving Saint Johns River, Florida: Continuing improvement from Jacksonville to the ocean, four hundred and twenty-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate five hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated; continuing improvement from Palatka to Lake Harney, thirty thousand dollars.

Proviso. Contracts.

Palatka to Lake Harney.

Water hyacinth, Fla. Removing.

Removing the water hyacinth, Florida, Texas, and Louisiana: For the removal of the water hyacinth from the navigable waters of the State of Florida, so far as it is or may become an obstruction to navigation, ten thousand dollars.

Choctawhatchee River, Fla. and Ala.

Improving Choctawhatchee River, Florida and Alabama: For maintenance of improvement, including Cypress Top outlet, five thousand dollars.

Escambia and Conecuh Rivers, Fla. and Ala.

Improving Escambia and Conecuh Rivers, Florida and Alabama: For maintenance, five thousand dollars.

Mobile, Ala. Bar.

Improving Mobile bar, Alabama: Continuing improvement and for maintenance, five thousand dollars.

Harbor.

Improving harbor at Mobile, Alabama: Continuing improvement, five hundred and five thousand dollars, of which amount five thousand dollars may be used in the removal of sunken logs, deadheads, and other obstructions.

Alabama River, Ala.

Improving Alabama River, Alabama: Continuing improvement and for maintenance, including the Alabama and Coosa Rivers between Montgomery and Wetumpka, seventy-five thousand dollars.

Black Warrior, Warrior, and Tombigbee Rivers, Ala.

Proviso. Contracts.

Improving Black Warrior, Warrior, and Tombigbee Rivers, Alabama: Continuing improvement from Mobile to the Mulberry and Locust forks by the construction of locks and dams, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Tombigbee River, Ala. and Miss.

Improving Tombigbee River, Alabama and Mississippi: For maintenance, from the mouth to Demopolis, Alabama, fifteen thousand dollars, and from Demopolis, Alabama, to Walkers Bridge, Mississippi, five thousand dollars.

Gulfport, Miss.

Dredge "Barnard."

Improving harbor at Gulfport, Mississippi: for maintenance of improvement of anchorage basin at Gulfport and channel therefrom to the anchorage or roadstead at Ship Island, and for the improvement and maintenance of channel at Ship Island Pass, one hundred thousand dollars, of which amount sixty thousand dollars, or so much thereof as may be necessary, may be expended for the repair and modification of the United States dredge Barnard, which is hereby transferred and assigned to Gulfport Harbor and Channel for use and to be operated in accordance with the provisions and recommendations contained in the report printed in Rivers and Harbors Committee Document Numbered Two, Sixtieth Congress, first session.

Horn Island Pass, Miss.

Improving Horn Island Pass, Mississippi: For maintenance, four thousand dollars.

Pearl River, Miss.

Improving Pearl River, Mississippi: Continuing improvement and for maintenance below Rockport, eight thousand dollars.

Yazoo River and tributaries, Miss.

Improving Yazoo River and tributaries, Mississippi: Continuing improvement and for maintenance, including Yazoo, Tallahatchie, Big Sunflower, and Coldwater Rivers, Tchula Lake, Steele and Washington Bayous, Lake Washington, and Bear Creek, twelve thousand five hundred dollars.

Mississippi River. Southwest Pass.

Improving Southwest Pass, Mississippi River: Continuing improvement and for maintenance, four hundred and fifty thousand dollars.

Bayou Teche, La.

Improving Bayou Teche, Louisiana: Continuing improvement and for maintenance, sixty thousand dollars.

Waterway, Franklin and Mermentau, La.
Vol. 34, p. 1089.
Changes.
Proviso.
Right of way.

Inland waterway between Franklin and Mermentau, Louisiana: To insure the selection of the most suitable route for the inland waterway channel from Franklin to Mermentau adopted by Congress in the river and harbor act of March second, nineteen hundred and seven, the Secretary of War is hereby authorized, on the recommendation of the Chief of Engineers, to make such changes in the location of said channel as may be considered desirable: *Provided*, That no change shall be made under this authorization unless the necessary right of way is secured to the United States free of cost.

Water hyacinth, La. and Tex.
Removing.

Removing the water hyacinth, Florida, Texas, and Louisiana: For the removal of the water hyacinth from the navigable waters in the States of Louisiana and Texas, so far as it is or may become an obstruction to navigation, twenty thousand dollars.

Red River, La., Ark., Tex., and Okla.
Distribution.

Improving Red River, Louisiana, Arkansas, Texas, and Oklahoma: Continuing improvement and for maintenance below Fulton, Arkansas, twenty thousand dollars; continuing improvement and for maintenance between Fulton, Arkansas, and Denison, Texas, twenty-five thousand dollars.

Aransas Pass, Tex.

Improving Aransas Pass, Texas: For maintenance, twenty-five thousand dollars.

Harbor Island, Tex.
Deep-water port.
Proviso.
Contracts.
No terminal monopoly, etc.
Easements.

For the construction of a deep-water harbor or port within the entrance to Aransas Pass, at Harbor Island, Texas, in accordance with the report submitted in House Document Numbered One thousand and ninety-four, Sixty-first Congress, third session, one hundred and twenty-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law not to exceed in the aggregate two hundred and fifty thousand dollars exclusive of the amounts herein and heretofore appropriated: *Provided further*, That no part of the amount herein appropriated or authorized to be appropriated shall be expended until the Secretary of War shall be satisfied that the interests of the general public are duly protected in the use of said harbor and that no terminal monopoly will be possible: *And provided further*, That the title or easements in any land needed in connection with the construction of the dike proposed as a part of this improvement shall be vested in the United States free of cost.

Galveston Channel, Tex.

Improving Galveston Channel, Texas: Continuing improvement under the existing project, which contemplates the excavation of a channel thirty feet deep and one thousand two hundred feet wide from the inner bar to Fifty-first Street and seven hundred feet wide from Fifty-first to Fifty-sixth Street, one hundred and twenty-five

Proviso. Extension of channel.

thousand dollars: *Provided*, That at such time as in the discretion of the Secretary of War the same may be required in the interests of navigation and commerce the western terminus of said channel may be extended to Fifty-seventh Street, with a width of one thousand feet between Fifty-first and Fifty-seventh Streets, as recommended in the report submitted in House Document Numbered Three hundred and twenty-eight, Sixty-first Congress, second session.

Galveston, Tex.

Improving harbor at Galveston, Texas: For maintenance, by dredging and repair of the jetties, one hundred and fifty-five thousand dollars.

Channel to Texas City, Tex.

Improving channel from Galveston Harbor to Texas City, Texas: Continuing improvement and for maintenance by dredging within the limits recommended in the report submitted in House Document Numbered Three hundred and twenty-eight, Sixty-first Congress, second session, fifty thousand dollars.

Sabine-Neches Canal, Tex.

Public laws, 2d sess., p. 649.

Improving the Sabine-Neches Canal, Texas, from the Port Arthur Ship Canal to the mouth of the Sabine River, the Neches River up to the town of Beaumont, and the Sabine River up to the town of Orange, to a navigable depth of twenty-five feet, in accordance with plan numbered four, submitted in House Document Numbered One thousand two hundred and ninety, Sixty-first Congress, third session, as follows:

From Port Arthur Ship Canal to the Neches, and to Beaumont.

Contracts.

For sections "a" and "c," from Port Arthur Ship Canal to mouth of Neches River and from mouth of Neches River to Beaumont, one hundred and fifty thousand dollars; and the Secretary of War may enter into contract or contracts for such materials and work as may be necessary to complete said sections to an amount not exceeding seven hundred and six thousand dollars, exclusive of the amount herein appropriated, of which amount not exceeding two hundred and seventy-eight thousand dollars shall be paid from appropriations to be hereafter made by law and the remainder from funds contributed by the Beaumont navigation district or other local interests: *Provided*, That no part of these amounts shall be expended and no contract shall be entered into until the Beaumont navigation district, a local organization created and existing under and by virtue of the laws of the State of Texas, or other local interests, shall have placed in some United States depository, to be selected by the Secretary of War, the sum of four hundred and twenty-eight thousand dollars to the credit of the Secretary of War, to be expended by him in equal amounts with moneys provided by the United States in prosecuting this work: *Provided further*, That said Beaumont navigation district or other local interests shall become bound, in manner satisfactory to the Secretary of War, to maintain said channel free of cost to the United States for a term of three years after the completion thereof,

Proviso. Contribution by local interests.

Maintenance, etc., free of cost.

Commencing work.

and to provide for the operation and maintenance of the guard lock without cost to the United States until otherwise provided by law, all in accordance with the recommendations in the report cited above: *Provided further*, That the Secretary of War may enter into contract for work on sections "a" and "c" at any time after the local interests have provided the moneys as above specified, independent of and without reference to section "b."

From Sabine River to Orange.
Contracts.

For section "b," fifty thousand dollars; and the Secretary of War may enter into contract or contracts for such materials and work as may be necessary to complete said section, to an amount not exceeding two hundred and thirty-seven thousand dollars, exclusive of the amount herein appropriated, of which amount not exceeding ninety-three thousand five hundred dollars shall be paid from appropriations to be hereafter made by law, and the remainder from funds contributed by the Orange navigation district or other local interests: *Provided*, That no part of these amounts shall be expended and no contract shall be entered into until the Orange navigation district or other local interests shall have placed in some United States depository, to be selected by the Secretary of War, the sum of one hundred and forty-three thousand five hundred dollars to the credit of the Secretary of War, to be expended by him in equal amounts with moneys provided by the United States in prosecuting this work: *Provided further*, That said Orange navigation district or other local interests shall become bound, in manner satisfactory to the Secretary of War, to maintain said channel free of cost to the United States for a term of three years, all in accordance with the recommendations in the report cited above.

Provisos.
Contribution by local interests.

Maintenance, etc., free of cost.

Port Bolivar, Tex.

Improving channel to Port Bolivar, Texas: For maintenance, twenty-five thousand dollars.

Sabine Pass, Tex.

Improving Sabine Pass, Texas: Continuing improvement and for maintenance, one hundred and fifty thousand dollars.

West Galveston Bay Channel, etc., Tex.

Improving West Galveston Bay Channel, Turtle Bayou, Trinity River, Anahuac Channel, Oyster Creek, Cedar, Chocolate, and Bastrop Bayous, Texas: Continuing improvement and for maintenance, including mouths of adjacent streams, twenty-five thousand dollars.

Brazos River, Tex.
At the mouth.

Improving mouth of Brazos River, Texas: Continuing improvement and maintenance by dredging and repair of the jetties, one hundred thousand dollars.

Velasco to Old Washington.

Improving Brazos River, Texas: Continuing improvement and for maintenance by open-channel work from Velasco to Old Washington, twenty-five thousand dollars.

Old Washington to Waco.

Improving Brazos River, Texas, from Old Washington to Waco: For the completion of lock and dam at Hidalgo Falls, fifty thousand dollars.

Trinity River, Tex.

Improving Trinity River, Texas: Continuing improvement and for maintenance by open-channel work, forty thousand dollars.

Cypress Bayou, Tex., and La.

Improving Cypress Bayou, Texas and Louisiana: For maintenance, two thousand five hundred dollars.

Ouachita River, Ark. and La.

Proviso. Contracts.

Improving Ouachita River, Arkansas and Louisiana: Continuing improvement by the construction of Locks and Dams Numbered Two, Four, Six, and Eight, two hundred and ninety-two thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said locks and dams, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Removing snags, etc.

Improving Ouachita River, Arkansas and Louisiana: Continuing improvement by removing snags, leaning trees, and other obstructions between Camden and Arkadelphia, in the State of Arkansas, seven thousand five hundred dollars.

Arkansas River. Pine Bluff, Ark.

Improving Arkansas River, Arkansas: For maintenance of improvement, including works at Pine Bluff and the operation of dredging plant, sixty-two thousand five hundred dollars.

Black and Current Rivers, Ark. and Mo.

Improving Black and Current Rivers, Arkansas and Missouri: For maintenance, seven thousand one hundred dollars.

Cache River, Ark.

Improving Cache River, Arkansas: For maintenance, three thousand dollars.

St. Francis River, etc., Ark.

Improving Saint Francis River, Arkansas: For maintenance of improvement of Saint Francis and L'Anguille Rivers, and Blackfish Bayou, two thousand five hundred dollars.

White River, Ark.

Improving White River, Arkansas: For maintenance, eighteen thousand dollars.

Cumberland River above Nashville, Tenn.

Improving Cumberland River above Nashville, Tennessee: Completing improvement for slack-water navigation between Lock and Dam Numbered Three, near Nashville, and Lock and Dam Numbered Seven, near Carthage, Tennessee, eighty-five thousand dollars.

Tennessee River above Chattanooga, Tenn.

Improving Tennessee River above Chattanooga, Tennessee: Continuing improvement and for maintenance, sixty-five thousand dollars.

Below Chattanooga.

Improving Tennessee River below Chattanooga, Tennessee, Alabama, and Kentucky: Continuing improvement and for maintenance by open-channel work from Chattanooga, Tennessee, to Riverton, Alabama, one hundred thousand dollars; continuing improvement and for maintenance below Riverton, Alabama, eighty thousand dollars.

Kentucky River, Ky. Locks and Dams Nos. 13 and 14.

Proviso. Contracts.

Improving Kentucky River, Kentucky: Continuing improvement by the construction of Locks and Dams Numbered Thirteen and Fourteen, one hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said locks and dams, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred and fifty thousand six hundred and fifty dollars, exclusive of the amounts herein and heretofore appropriated.

Ashtabula, Ohio.
Contracts.

Improving harbor at Ashtabula, Ohio: The Secretary of War is hereby authorized to enter into a contract or contracts for such materials and work as may be necessary for the prosecution of this improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate four hundred and seventy-four thousand six hundred and seventy-five dollars, exclusive of the amounts heretofore appropriated.

Conneaut, Ohio.
Proviso.
Contracts.

Improving harbor at Conneaut, Ohio: Continuing improvement, one hundred and sixty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and twenty thousand seven hundred and thirty-eight dollars, exclusive of the amounts herein and heretofore appropriated.

Lorain, Ohio.

Improving harbor at Lorain, Ohio: For maintenance, five thousand dollars.

Toledo, Ohio.

Improving harbor at Toledo, Ohio: Continuing improvement, seventy-five thousand dollars.

Ohio River.
Locks and dams.
Proviso.
Contracts.

Improving Ohio River: Continuing improvement by the construction of locks and dams with a view to securing a navigable depth of nine feet, two million dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three million dollars, exclusive of the amounts herein and heretofore appropriated.

Open-channel work.

Improving Ohio River: Continuing improvement and for maintenance by open-channel work, two hundred and twenty-nine thousand five hundred dollars.

Alpena, Mich.

Improving harbor at Alpena, Michigan: For maintenance, ten thousand dollars.

Arcadia, Mich.

Improving harbor at Arcadia, Michigan: For dredging and maintenance, ten thousand dollars.

Frankfort, Mich.

Improving harbor at Frankfort, Michigan: For maintenance, ten thousand dollars.

Grand Haven, Mich.

Improving harbor at Grand Haven, Michigan: For maintenance, thirty-four thousand dollars.

Grand Marais, Mich.

Harbor of refuge at Grand Marais, Michigan: For maintenance, ten thousand dollars.

Holland, Mich.

Improving inner and outer harbor at Holland, Michigan: For maintenance, sixteen thousand dollars.

Ludington, Mich.

Improving harbor at Ludington, Michigan: For maintenance, ten thousand dollars.

Mackinac Harbor, Mich. Contracts.

Improving Mackinac Harbor, Michigan: The Secretary of War is hereby authorized to enter into a contract or contracts for such materials and work as may be required for the completion of this improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate fifty-five thousand dollars, exclusive of the amount heretofore appropriated.

Manistee, Mich.

Improving harbor at Manistee, Michigan: Completing improvement and for maintenance, ten thousand dollars.

Manistique, Mich.

Improving harbor at Manistique, Michigan: Completing improvement, one hundred and thirty-eight thousand four hundred and sixty-two dollars.

Marquette, Mich. Harbor of refuge.

Harbor of refuge at Marquette Bay, Michigan: For maintenance, two thousand dollars.

Harbor.

Improving harbor at Marquette, Michigan: Continuing improvement and for maintenance, eighty-eight thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and eleven thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Muskegon, Mich.

Improving harbor at Muskegon, Michigan: For maintenance, ten thousand dollars.

Saugatuck, and Kalamazoo River, Mich.

Improving harbor at Saugatuck, and Kalamazoo River, Michigan: Completing improvement and for maintenance, thirty thousand dollars.

South Haven, Mich. Contracts.

Improving South Haven Harbor, Michigan: The Secretary of War is hereby authorized to enter into a contract or contracts for such materials and work as may be necessary for the completion of this improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and ninety-eight thousand dollars, exclusive of amounts heretofore appropriated.

Black River, Mich.

Improving Black River at Port Huron, Michigan: For maintenance, five thousand dollars.

Clinton River, Mich.

Improving Clinton River, Michigan: For maintenance, two thousand dollars.

Detroit River, Mich.

Improving Detroit River, Michigan: Continuing improvement in accordance with plan A, three hundred and seventy-five thousand dollars.

Rouge River, Mich.

Improving Rouge River, Michigan: For maintenance, five thousand dollars: *Provided*, That no part of this sum shall be expended at those points within the limits of the project where shoaling is due to caving banks until the banks shall have been protected by suitable docks or revetments constructed at the expense of the riparian interests.

Proviso. Protection by riparian interests.

Ashland, Wis.

Improving harbor at Ashland, Wisconsin: Continuing improvement and for maintenance, thirty thousand dollars.

Kenosha, Wis.

Improving harbor at Kenosha, Wisconsin: For maintenance, eleven thousand dollars.

Kewaunee, Wis.

Improving harbor at Kewaunee, Wisconsin: For maintenance, eighteen thousand dollars.

Port Wing, Wis.

Improving harbor at Port Wing, Wisconsin: Continuing improvement and for maintenance, three thousand dollars.

St. Croix River, Wis. and Minn.

Improving Saint Croix River, Wisconsin and Minnesota: For maintenance, three thousand six hundred dollars.

Agate Bay, Minn.

Improving harbor at Agate Bay, Minnesota: For maintenance, two thousand dollars.

Lake of the Woods, Zippel Bay, Minn.

Improving Zippel Bay, Lake of the Woods, Minnesota: Completing improvement in accordance with the report submitted in House Document Numbered Twelve hundred and seventy-six, Sixty-first Congress, third session, twenty-seven thousand seven hundred and eighty-one dollars.

Minnesota River, Minn.

Improving Minnesota River, Minnesota: For maintenance, two thousand dollars.

Red River of the North, Minn. and N. Dak.

Improving Red River of the North, Minnesota and North Dakota: For maintenance, seven thousand five hundred dollars.

Michigan City, Ind.

Improving harbor at Michigan City, Indiana: For maintenance, including repair and maintenance of the east breakwater, twenty-three thousand dollars.

Calumet River, Ill. and Ind.

Improving Calumet River, Illinois and Indiana: For maintenance, ten thousand dollars.

Chicago, Ill.

Contracts.

Improving harbor at Chicago, Illinois: The Secretary of War is hereby authorized to enter into a contract or contracts for such materials and work as may be required for the prosecution and maintenance of this improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred and forty thousand dollars, exclusive of the amounts heretofore appropriated.

Waukegan, Ill.

Improving harbor at Waukegan, Illinois: For maintenance, ten thousand dollars.

Chicago River, Ill.

Proviso.

Contracts.

Improving Chicago River, Illinois: For maintenance, thirty-four thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and forty-two thousand six hundred dollars, exclusive of the amounts herein and heretofore appropriated.

Illinois & Mississippi Canal.

Improving Illinois and Mississippi Canal by raising Aqueduct One, Lock Four, one highway bridge and approaches and the banks of the canal where the canal crosses East Bureau Creek, just below the Chicago, Rock Island and Pacific Railway bridge across the same stream, one hundred and twenty-five thousand dollars.

Mississippi River Commission.
Mississippi River.
From Head of Passes to the Ohio.
Securing 9-foot channel.
Levees.
Surveys.
Provisos.
Dredge boats, etc.
Connecting water courses.

Improving Mississippi River from Head of Passes to the mouth of the Ohio River, including salaries, clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission: Continuing improvement, with a view to securing a permanent channel depth of nine feet, three million dollars, which sum shall be expended under the direction of the Secretary of War in accordance with the plans, specifications, and recommendations of the Mississippi River Commission, as approved by the Chief of Engineers, for the general improvement of the river, for the building of levees between the Head of Passes and Cape Girardeau, Missouri, and for surveys, including the survey from the Head of Passes to the headwaters of the river, in such manner as in their opinion shall best improve navigation and promote the interests of commerce at all stages of the river: *Provided*, That of the money hereby appropriated so much as may be necessary shall be expended in the construction of suitable and necessary dredge boats and other devices and appliances and in the maintenance and operation of the same: *Provided further*, That the water courses connected with said river and the harbors upon it, now under the control of the Mississippi River Commission and under improvement, may, in the discretion of said commission, upon approval by the Chief of Engineers, receive allotments for improvements now under way or hereafter to be undertaken, to be paid for from the amounts herein appropriated.

From the Ohio to the Missouri.

Improving Mississippi River from the mouth of the Ohio River to and including the mouth of the Missouri River: Continuing improvement and for maintenance, one million dollars.

From the Missouri to Minneapolis.
Proviso.
Dredging, etc.

Improving Mississippi River from the mouth of the Missouri River to Minneapolis, Minnesota: Continuing improvement and for maintenance, one million two hundred and fifty thousand dollars: *Provided*, That of this amount so much as shall be necessary, not to exceed seventy-five thousand dollars, may, in the discretion of the Secretary of War, be expended for the repair and maintenance of existing levees constructed by the United States and for dredging for the benefit of through navigation in harbors and at landing places, giving preference to localities in which the communities interested shall hereafter maintain such dredging without cost to the United States.

St. Paul, Minn.
Changes of harbor lines.

The Secretary of War is hereby authorized to permit such changes of harbor lines and diversion of the channel of the Mississippi River at Saint Paul, Minnesota, as may be necessary to provide for the improvement of navigation, for suitable levees, transportation terminals, and landing places for shipping in said city.

Approval by Secretary of War, etc.

Such changes and diversion shall be shown by plans and plats to be prepared by the city of Saint Paul, which shall be filed with and approved by the Secretary of War and the Chief of Engineers before any work shall be done thereon, and any change therefrom shall be unlawful unless a plan and plat thereof shall have been previously filed with and approved by the Secretary of War and the Chief of Engineers: *Provided*, That the Secretary of War and the Chief of Engineers shall submit to Congress an estimate of the amount, character, and cost of any work deemed proper to be done by the United States in connection with the improvement herein authorized, the expense connected with the preparation of such estimate to be paid from the appropriation for examinations, surveys, and contingencies of rivers and harbors: *Provided further*, That neither this Act nor any action taken thereunder by the Secretary of War and the Chief of Engineers shall be construed as in any way committing the United States to any expense or obligation without further direction of Congress.

Provisos. Estimates, etc.

Further action of Congress required.

As a condition thereof it shall be agreed by the said city of Saint Paul as a part of said proposed plan that the said levees and landing places for shipping shall remain under the ownership or control of the said municipality unless otherwise authorized by Congress.

Ownership of levees, etc.

Improving Mississippi River from Saint Paul to Minneapolis, Minnesota: Continuing improvement, two hundred and fifty thousand dollars.

From St. Paul to Minneapolis.

Reservoirs at headwaters of Mississippi River: Completing construction of canal between Lake Winnibigoshish and Leech Lake, ten thousand dollars.

Canal, Lake Winnibigoshish to Leech Lake.

Improving Missouri River, with a view to securing a permanent six-foot channel between Kansas City and the mouth of the river: The Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the improvement, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate six hundred thousand dollars, exclusive of the amounts heretofore appropriated.

Missouri River.
Kansas City, Mo., to mouth.
Six-foot channel.
Contracts.

Improving Gasconade River, Missouri: Continuing improvement and for maintenance, ten thousand dollars.

Gasconade River, Mo.

Improving Osage River, Missouri: Continuing improvement and for maintenance, fifteen thousand dollars.

Osage River, Mo.

Improving harbor at Humboldt Bay, California: For maintenance of improvement of the channel in front of Eureka, fifteen thousand dollars.

Humboldt Bay, Cal.
Channel at Eureka.

Improving harbor at Humboldt Bay, California: Continuing improvement, one hundred and seventy thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate seven hun-

Harbor.

Proviso. Contracts.

dred and seventeen thousand four hundred dollars, exclusive of the amounts herein and heretofore appropriated.

Los Angeles, Cal.
Proviso.
Dredging plant.

Improving Los Angeles Harbor, California: Continuing improvement by dredging, two hundred and seventy thousand dollars: *Provided*, That if in the judgment of the Secretary of War the prices received in response to advertisement for bids for dredging are not reasonable, so much of the amount herein appropriated as shall be necessary may be expended for the purchase or construction of a suitable dredging plant.

Oakland, Cal.
Proviso.
Dredging plant.

Improving harbor at Oakland, California: Continuing improvement, one hundred and fifty thousand dollars: *Provided*, That if in the judgment of the Secretary of War the prices received in response to advertisement for bids for dredging are not reasonable, so much of the amount herein appropriated as shall be necessary may be expended for the purchase or construction of a suitable dredging plant.

San Pablo Bay, Cal.
Channel over Pinole Shoal.

Improving channel over Pinole Shoal, San Pablo Bay, California, in accordance with the report submitted in House Document Numbered Eleven hundred and three, Sixtieth Congress, second session, including the construction of a dredge for maintenance, four hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and sixty thousand dollars, exclusive of the amount herein appropriated.

Proviso.
Contracts.

Mokelumne River, Cal.

Improving Mokelumne River, California: For maintenance, five thousand dollars.

Petaluma Creek and Napa River.

Improving Petaluma Creek and Napa River, California: For maintenance, eleven thousand dollars.

Sacramento and Feather Rivers, Cal.

Improving Sacramento and Feather Rivers, California: Continuing improvement and for maintenance, twenty-five thousand dollars.

San Joaquin River, Cal.

Improving San Joaquin River, California: For maintenance, including Stockton and Mormon Channels, twenty-five thousand dollars.

Coos Bay, Oreg.

Improving harbor at Coos Bay, Oregon: Continuing improvement at the entrance and in the channels within the bay, and for maintenance, forty thousand dollars.

Tillamook Bay, Oreg.

Improving Tillamook Bay and Bar, Oregon: For maintenance, five thousand dollars.

Willamette and Yamhill Rivers, Oreg.

Improving Willamette and Yamhill Rivers, Oregon: For maintenance of improvement of Willamette River above Portland, and Yamhill River, twenty thousand dollars.

Columbia and Willamette Rivers, below Portland.

Improving Columbia and lower Willamette Rivers below Portland, Oregon: Continuing improvement and for maintenance, three hundred and fifty thousand dol-

Proviso.
Contracts, etc.

lars: *Provided*, That the Secretary of War may enter into contract or contracts for such materials and work as may be necessary for the construction of two suitable dredging plants, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate three hundred and twenty thousand dollars exclusive of the amounts herein and heretofore appropriated.

Columbia River, Oreg. and Wash.
At the mouth.

Improving mouth of Columbia River, Oregon and Washington: Continuing improvement and for maintenance, including repairs and operation of dredge, nine hundred and fifty thousand dollars.

Gauging.

For gauging waters of Columbia River and measuring tidal and river volumes, one thousand dollars.

Vol. 36, p. 663, amended.

The provision of the river and harbor act approved June twenty-fifth, nineteen hundred and ten, making appropriation for improving Siuslaw River, Oregon, is hereby amended so as to read as follows:

Siuslaw River, Oreg.
Improvement at the mouth.
Provisos.
Contracts.
Contribution by Siuslaw.
Construction of south jetty by Siuslaw.
Amount to be deducted from contribution.

"Improving Siuslaw River, Oregon, at the mouth, in accordance with the project set forth in the report submitted in House Document Numbered Six hundred and forty-eight, Sixty-first Congress, second session, fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such material and work as may be necessary to complete said project and to maintain the same for one year during construction, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and sixty-five thousand five hundred dollars, exclusive of the amount herein appropriated: *Provided further*, That before beginning said work or making said contract or contracts the Secretary of War shall be satisfied, by deposit or otherwise, that the port of Siuslaw or other agency shall provide for the accomplishment of said project the additional sum of two hundred and fifteen thousand five hundred dollars, which said sum shall be expended by the Secretary of War in the prosecution of said work and for its maintenance in the same manner and in equal amount as the sum herein appropriated and authorized to be appropriated from the Treasury of the United States: *And provided further*, That the port of Siuslaw may proceed with the construction of the south jetty in pursuance of the contract with Robert Wakefield, entered into December twenty-fourth, nineteen hundred and nine, to the full extent of said contract; and the amount to be furnished by the said port of Siuslaw, or other agency, as aforesaid, may be reduced by such amounts, not exceeding one hundred thousand dollars, as may be expended under said contract, provided all the work so done shall be in accord with the project herein adopted and satisfactory to the Secretary of War."

Columbia River.
From the Willamette to Vancouver, Wash.

Improving Columbia River, Washington: For maintenance of improvement between the mouth of Willamette River and the city of Vancouver, Washington, three thousand dollars.

The Dalles Rapids to Celilo Falls.

Improving Columbia River between the foot of The Dalles Rapids and the head of Celilo Falls, Oregon and Washington: Continuing improvement, six hundred thousand dollars.

Celilo Falls to Snake River.

Improving Columbia River and tributaries above Celilo Falls to the mouth of Snake River, Oregon and Washington: Continuing improvement, twenty-five thousand dollars.

Snake River, Oreg., Wash., and Idaho.

Improving Snake River, Oregon, Washington, and Idaho: Continuing improvement and for maintenance up to Pittsburg Landing, Oregon, fifteen thousand dollars.

Bellingham, Wash.
Cooperation by local interests.
Proviso.
Contracts.

Improving harbor at Bellingham, Washington: Continuing improvement, in accordance with the report submitted in House Document Numbered Eleven hundred and sixty-one, Sixtieth Congress, second session, and subject to the conditions relative to cooperation on the part of local interests as set forth in said document, twenty-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate fifty-two thousand two hundred and fifty dollars, exclusive of the amounts herein and heretofore appropriated.

Grays Harbor, Wash.
Proviso.
Contracts.

Improving Grays Harbor and Bar Entrance, Washington: Continuing improvement by means of extension of north jetty, three hundred thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate six hundred and fifty-five thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Olympia, Wash.
Cooperation by local interests.

Improving harbor at Olympia, Washington: Completing improvement in accordance with the report of the Board of Engineers for Rivers and Harbors dated March ninth, nineteen hundred and eight, and printed in Rivers and Harbors Committee Document Numbered Five, Sixty-first Congress, second session, and subject to the conditions relative to cooperation on the part of local interests, as set forth in said document, forty-three thousand dollars.

Willapa River and Harbor, Wash.
Cooperation by local interests.

Improving Willapa River and Harbor, Washington: Continuing improvement in accordance with the report submitted in House Document Numbered Five hundred and twenty-four, Sixty-first Congress, second session, and subject to the conditions relative to cooperation on the part of local interests, as set forth in said document, fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and eighteen thousand one hundred and thirty-two dollars, exclusive of the amounts herein and heretofore appropriated.

Proviso. Contracts.

Chehalis River, Wash.

Improving Chehalis River, Washington: Completing improvement, ten thousand dollars.

Cowlitz and Lewis Rivers, Wash.

Improving Cowlitz and Lewis Rivers, Washington: For maintenance, including North Fork of Lewis River, two thousand five hundred dollars.

Grays River, Wash.

Improving Grays River, Washington: For maintenance, five hundred dollars.

Puget Sound, etc., Wash.

Improving Puget Sound, Washington: Continuing improvement and for maintenance of Puget Sound and its tributary waters, twenty thousand dollars.

Snohomish River, Wash.

Proviso. Contracts.

Improving Snohomish River, Washington: Continuing improvement, seventy-five thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to complete the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate one hundred and eighty thousand dollars, exclusive of the amounts herein and heretofore appropriated.

Hilo, Hawaii.

Provisos. Contracts.

Resurvey authorized.

Improving harbor at Hilo, Hawaii: Continuing improvement, two hundred and fifty thousand dollars: *Provided*, That the Secretary of War may enter into a contract or contracts for such materials and work as may be necessary to prosecute the said project, to be paid for as appropriations may from time to time be made by law, not to exceed in the aggregate two hundred and fifty thousand dollars, exclusive of the amounts herein and heretofore appropriated: *Provided further*, That the Secretary of War be authorized to have a resurvey made of Hilo Harbor with a view to determining whether a modification of the adopted project can be made which will increase the commercial facilities of the harbor without increasing the original limit of cost of the work.

Kahului Harbor, Hawaii.

Improving Kahului Harbor, Hawaii: Continuing improvement, one hundred and fifty thousand dollars.

Depth of waters defined.

The depth of water in tidal waters, as well as in rivers and nontidal channels, whenever referred to in this act shall be understood to mean the depth at mean low water unless otherwise expressed.

Maintenance, etc., of existing works.

Appropriations made for the respective works herein named, or so much thereof as may be necessary, may, in the discretion of the Secretary of War, be used for maintenance and for the repair and restoration of said works whenever from any cause they have become seriously impaired, as well as for the further improvement of said works.

Surveys, etc., paid from amount for project.

Surveys and examinations provided for in this section shall, unless otherwise expressed, be paid for from the appropriations made for the respective improvements or projects to which they pertain or in connection with which they are mentioned.

Works by contract or otherwise.

All works of improvement herein or hereafter authorized to be prosecuted or completed under contracts may, in the discretion of the Secretary of War, be carried on by contract or otherwise, as may be most economical or advantageous to the United States.

Allotment of consolidated works.

Where separate works or items are consolidated in this act and an aggregate amount is appropriated therefor, the amounts herein appropriated shall, unless otherwise expressed, be expended in securing maintenance and improvement according to the respective projects herein or heretofore adopted by Congress, after giving due regard to the respective needs of traffic. The allotments to the respective works herein consolidated shall be made by the Secretary of War upon recommendations by the Chief of Engineers. In case such works or items are consolidated and separate amounts are given with each project, the amounts so named shall be expended upon such separate projects unless, in the discretion of the Secretary of War, another allotment or division should be made of the same. Any balances now remaining to the credit of the consolidated items in this Act shall be carried to the credit of the respective aggregate amounts appropriated for the consolidated items herein contained.

Balances carried to authorized works.

Classification of traffic statistics.

In the collection of statistics relating to traffic, the Corps of Engineers is directed to adopt a uniform system of classification for freight, and upon rivers or inland waterways to collate ton-mileage statistics as far as practicable.

Appropriation for examinations, etc.

SEC. 2. That for examinations, surveys, and contingencies for rivers and harbors for which there may be no special appropriation, the sum of three hundred thousand dollars is hereby appropriated: *Provided*, That no preliminary examination, survey, project, or estimate for new works other than those designated in this or some prior Act or joint resolution shall be made: *Provided further*, That after the regular or formal reports made as required by law on any examination, survey, project, or work under way or proposed are submitted no supplemental or additional report or estimate shall be made unless ordered by a concurrent resolution of Congress: *And provided further*, That the Government shall not be deemed to have entered upon any project for the improvement of any waterway or harbor mentioned in this Act until funds for the commencement of the proposed work shall have been actually appropriated by law.

Provisos. Authority required.

Supplementary reports restricted.

Special authority to begin work required.

Allotment of preliminary examinations.

The Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys to be made at the following-named localities, and a sufficient sum to pay the cost thereof may be allotted from the amount appropriated in this section:

Maine.

Rockland Harbor, Maine, at and near Atlantic Point.

Kennebec River, channel west of Swan Island, Maine.

Bluehill Inner Harbor, Maine.

Winter Harbor, Maine.

Carvers Harbor, Vinalhaven, Maine.

Massachusetts.

Boston Harbor, Massachusetts, with a view to the construction of a sea wall along Winthrop Beach.

Cohasset Harbor, Massachusetts, with a view to the construction of a channel one hundred and fifty feet in width and eight feet in depth.

Rhode Island.

Providence River and Harbor, Rhode Island, with a view to deepening the channel to thirty feet.

Connecticut.

Mystic River, Connecticut, from the drawbridge between Groton and Stonington to the head of navigation.

New York.

Hudson River, New York, with a view to increasing the width of the channel between the Albany and Greenbush bridge and the New York Central and Hudson River Railroad passenger bridge.

Hudson River, New York, with a view to securing a suitable depth along the front of Rensselaer between the lower and middle bridges.

New York Harbor, New York, with a view to securing a suitable depth of channel to the navy yard.

For a deep-water connection with suitable terminals that may be established at North Tonawanda at the head of the New York State Barge Canal.

Fort Pond Bay, Suffolk County, New York.

New York Harbor, New York, with a view to securing increased width and depth of water from a point at or near Southwest Spit, northwest of Sandy Hook, New Jersey, through Lower New York Bay, Raritan Bay, and the channel between New Jersey and Staten Island, New York, to the channel in Upper New York Bay.

Niagara River, New York, with a view to securing a depth of fourteen feet in the channel between Navy and Grand Islands leading to the foot of Sugar Street, in the city of Niagara Falls.

Pennsylvania.

Delaware River, at Morrisville, Pennsylvania.

Allegheny River, Pennsylvania, with a view to the construction of additional locks and dams.

Delaware.

Leipsic River, Delaware.

Appoquinimink River, Delaware.

Mispillion River, Delaware.

Murderkill River, Delaware.

Little River, Delaware.

Maryland.

Elk River and Little Elk River, Maryland.

Channel connecting Miles River and Tred Avon River near Royal Oak, Maryland.

Susquehanna River, Maryland.

Manokin River, Maryland.

Virginia.

Harbor at Newport News, Virginia, and waters near, in, and about the city of Newport News, with a view to securing increased anchorage area for small craft.

Cape Charles City Harbor, Virginia, with a view to straightening the north side of channel at the entrance and increasing the width of the channel to two hundred feet.

Western Branch of Elizabeth River, Virginia, with a view to deepening and widening the approach thereto.

Potomac River, at Colonial Beach, Virginia, with a view to a proper approach to the landing place.

North Carolina.

Pamlico River, North Carolina, with a view to improving the inner channel on the north side of that river, and with a further view of removing any excavated material which may have heretofore been placed therein by the War Department, beginning at the mouth of Runyons Creek, on the north side of said river, below Washington, North Carolina, and extending eastwardly down said river as far as may be necessary.

Northeast Cape Fear River, North Carolina, from its mouth to Hallsville.

Chowan River, North Carolina.

Conoby Creek, North Carolina.

Deep Creek, North Carolina, from its mouth on Albemarle Sound to the head of navigation.

South River, North Carolina, with a view to obtaining increased depth above Aurora.

Swift Creek, Craven County, North Carolina, with a view to dredging a channel through Horse Shoe Bend and Poplar Branch.

South Carolina.

Basin of Winyah Bay, South Carolina, with a view to providing a uniform depth of eighteen feet at mean low water and to giving increased harbor facilities to the city of Georgetown.

Georgia.

Darien Harbor and Doboy Bar, Georgia, with a view to securing the same depth on the bar as in the harbor, namely, twelve feet at mean low water.

Tugaloo River, Georgia and South Carolina, from its mouth to Fort Madison, South Carolina.

Florida.

Clearwater Harbor, Florida, from the mouth of the Anclote River to the beginning of the channel now being constructed by the Government from the south end of Clearwater Harbor into and through Boca Ceiga Bay, thence into Tampa Bay.

Saint Johns River, Florida, from deep water at or below Commodores Point to deep water above Sixmile Creek westward of the middle ground between Arlington Cut and the western shore of the river, including a full consideration of the desirability and propriety of cooperation on the part of riparian owners.

Saint Marks River, Florida, from the town of Saint Marks to the Gulf of Mexico.

Channel between the Saint Johns River, Florida, and Cumberland Sound, by way of the Sisters Creek out of the Saint Johns River, with a view to straightening and deepening the channel.

Harbor at Saint Petersburg, Florida.

Carrabelle Harbor, Florida, with a view to securing a depth of twenty-one feet in the channel from the Gulf of Mexico to deep water in Saint George Sound by way of East Pass; also for a channel of the same depth from the Gulf to Carrabelle.

Pithlachascotee River, Florida.

Saint Lucie Inlet, Florida, with a view to obtaining a depth of from twelve to fourteen feet.

Wekiva River, Florida.

Alabama.

Alabama River, Alabama, with a view to the construction of a lock and dam between Montgomery and Selma.

Louisiana.

Bayou Lafourche, Louisiana, with a view to securing a depth of twenty feet at its mouth.

Bayou Chastaing, Louisiana.

Mermentau River, Louisiana, with a view to the construction of a lock and dam to maintain the level of Grand Lake and the inland waterways of Louisiana.

Ponchatoula River, Louisiana.

Tangipahoa River, Louisiana.

Louisiana and Texas.

For a lock in the proposed dam at the foot of Caddo Lake, Louisiana and Texas, and a channel from said dam to the Red River by way of Big Pass, Little Pass, Soda Lake, Twelvemile Bayou, and Cross Bayou.

Texas.

Guadalupe River, Texas, to Victoria, with a view to improvement by locks and dams.

Colorado River, Texas, with a view to improvement by locks and dams.

The mouth of the Brazos River to Velasco, Texas.

Kentucky.

Green River, Kentucky, at and near Lock and Dam Numbered Three, near Rochester, with a view to the diversion of the waters of Mud River from its present mouth above the said lock and dam to a suitable point below.

North Fork of Kentucky River, Kentucky, with a view to the removal of obstructions.

Ohio.

Survey and estimate of the cost of improving the Cuyahoga River, Ohio, from its mouth to a more southerly connection with the Ohio Canal, with a view to eliminating bends and securing a navigable depth of twenty-one feet, with suitable width; and the said survey and estimate shall include a report on any proposition for cooperation by localities affected thereby.

Michigan.

Petoskey Harbor, Michigan.

White Lake Harbor, Michigan, from the mouth of the channel to White Lake.

Pentwater Harbor, Michigan, from the mouth of the channel to Pentwater Lake.

Saint Joseph Harbor, Michigan, with a view to its further improvement by the removal of a shoal and the securing of increased width and depth of channel below the Pere Marquette Railroad bridge.

Wisconsin. Brule Harbor, Wisconsin.

Cornucopia Harbor, Wisconsin.

Manitowoc Harbor and River, Wisconsin, with a view to their further improvement to meet the demands of commerce by the deepening of said river and by the enlargement of the dredged area of the basin inside the breakwaters, or otherwise; also with a view to the creation of a harbor of refuge within said river and basin.

Minnesota. Lake of the Woods, at or near Arnesen, Minnesota, with a view to securing increased harbor facilities.

Indiana. Indiana Harbor, Indiana, with a view to the construction of a breakwater to protect the entrance of the harbor.

Illinois. Mississippi River between Calhoun Point and Mason Island, Illinois.

California. Crescent City Harbor, California.

Newport Harbor, California.

Richmond Harbor, California.

Santa Barbara Harbor, California.

San Joaquin River, California, with a view to its improvement up to a point at or near Herndon by means of locks and dams, or otherwise.

Fremont Channel and McLeoad Lake arms of Stockton Channel, San Joaquin River, California.

Mokelumne River, California, with a view to its improvement from the Galt-New Hope Bridge to a point at or near Woodbridge.

Oregon. Nehalem River, Oregon.

Nehalem Bar and entrance to Nehalem Bay, Oregon, with view to improvement of same in cooperation with local interests.

Oregon Slough branch of Columbia River, Oregon, including a consideration of any proposition for cooperation by localities affected thereby.

Yaquina River, Oregon, from Toledo to Yaquina, with report upon any proposition for cooperation by local interests.

Alaska. Entrance to Kuskokwim River, through Kuskokwim Bay, Alaska.

Sergius Narrows, Alaska.

Apoon mouth of Yukon River from Pastol Bay to the mouth of Kotlik River, Alaska.

Porto Rico. San Juan Harbor, Porto Rico.

Report of examinations. In all cases a preliminary examination of the river, harbor, or other proposed improvement mentioned shall first be made, and a report as to the advisability of its improvement shall be submitted, unless a survey or estimate is herein expressly directed. Unfavorable reports. If upon such preliminary examination the proposed improvement is not deemed advisable, no further action shall be taken thereon without the further direction of Congress; but in case the report shall be favorable to such proposed improvement, or that a survey and estimate should be made to determine the advisability of improvement, the Secretary of War is hereby authorized, in his discretion, to cause surveys to be made, and the cost and advisability to be reported to Congress. And such reports containing plans and estimates shall also contain a statement as to the rate at which the work should be prosecuted.

Survey, etc., if favorable.

Requirements.

Printing of examinations, etc., during recess.

All reports on examinations and surveys which may be prepared during the recess of Congress shall, in the discretion of the Secretary of War, be printed by the Public Printer as documents of the following session of Congress.

Review of reports, etc., by Board of Engineers for Rivers and Harbors.

Vol. 32, p. 372.

SEC. 3. That all reports on examinations and surveys authorized in any section of this Act shall be reviewed by the Board of Engineers for Rivers and Harbors as provided for in section three of the river and harbor Act approved June thirteenth, nineteen hundred and two, and all special reports ordered by Congress shall, in the discretion of the Chief of Engineers, be reviewed in like manner by said board.

National Waterways Commission.

Vol. 35, p. 819, amended.

Term continued until Nov. 4, 1911.

SEC. 4. That so much of section seven of the river and harbor Act approved March third, nineteen hundred and nine, as provides that the term of the National Waterways Commission shall expire on March fourth, nineteen hundred and eleven, be, and the same is hereby, repealed; and the said commission, with its present membership and as now constituted, shall be continued until November fourth, nineteen hundred and eleven, with the powers and duties prescribed in said Act. And the said commission shall make a final report to Congress and file the same with the Secretary of the Senate and the Clerk of the House of Representatives not later than November fourth, nineteen hundred and eleven. Said commission is also authorized to investigate and report upon the advisability and feasibility of proposed artificial waterways and upon proposed plans for the impounding of flood waters in rivers, by reservoirs or otherwise, including the following: First, the construction by the United States of the proposed canal from the Ohio River, at a point near Pittsburg, to Lake Erie, the expense thereof being borne by local interests affected; second, the proposed canal from Lake Erie, by way of the Maumee River and Fort Wayne, or other direct and feasible route, to the southerly end of Lake Michigan; and, third, the proposed canal to connect the Anacostia River at some point near the District of Columbia boundary line with Chesapeake Bay, or some tributary thereof. For the obtaining of the necessary engineering data the commission is authorized to call upon the Corps of Engineers, United States Army, and said corps shall furnish said data upon the request of the commission, and the expense of obtaining the same shall be paid from the appropriation made by said Act.

Final report.

To investigate, etc., artificial waterways, and flood reservoirs.

Canal from the Ohio to Lake Erie.

Canal from Lake Erie to Lake Michigan.

Canal, Anacostia River, D. C., to Chesapeake Bay.

Engineer Corps.

Army.
Engineer Corps increased.
Vol. 33, p. 263.

SEC. 5. That the Corps of Engineers of the United States Army is hereby increased by five colonels, six lieutenant colonels, nineteen majors, seventeen captains, and thirteen first lieutenants. The increase in each grade hereby provided for shall be extended over a period of five years as nearly as practicable, and the original vacancies hereby created in each grade shall be filled by promotion from the next lower grade in accordance with existing law: *Provided*, That officers of the Corps of Engineers, when on duty under the Chief of Engineers, connected solely with the work of river and harbor improvements may, while so employed, be paid their pay and commutation of quarters from the appropriations for the work or works upon which they are employed: *Provided further*, That whenever it shall be necessary, in order to properly prosecute works of river and harbor improvement, the Chief of Engineers is authorized to detail for duty in charge of river and harbor districts or as members of boards of engineers any assistant engineers in the employ of the Engineer Bureau of the War Department. Vacancies in the grade of second lieutenant in the Corps of Engineers shall hereafter be filled, as far as may be consistent with the interests of the military service, by promotions from the Corps of Cadets at the United States Military Academy: *Provided*, That vacancies remaining in any fiscal year after the assignment of cadets of the class graduating in that fiscal year may be filled from civil life as hereinafter provided: *And provided further*, That the proportion of any graduating class assigned to the Corps of Engineers shall not be less than the proportion which the total number of officers authorized at date of graduation for that corps bears to the total number of officers authorized at same date for all branches of the Army to which cadets are eligible for promotion upon graduation, except when such a proportionate number is more than the number of vacancies existing at date of graduation plus the number of retirements due to occur in the Corps of Engineers prior to the first day of the following January. To become eligible for examination and appointment, a civilian candidate for the appointment as second lieutenant must be an unmarried citizen of the United States between the ages of twenty-one and twenty-nine, who holds a diploma showing graduation in an engineering course from an approved technical school, and is eligible for appointment as a junior engineer under the Engineer Bureau of the War Department. Selection of eligible civilians for appointment, including term of probation, shall be made as the result of such competitive examination into the mental, moral, and physical qualifications, and under such rules and regulations as shall be recommended by the Chief of Engineers and approved by the Secretary of War.

Extended over five years.
Original vacancies.
Provisos.
Officers on river and harbor duty to be paid from appropriation for the work.
Details of assistant engineers.
Filling vacancies in grade of second lieutenants.
From Military Academy.
From civil life.
Assignment of graduating cadets.
Eligibility for appointments from civil life.
Examinations, etc.

Approved, February 27, 1911.

CHAP. 168.—An Act To authorize the Pensacola, Mobile and New Orleans Railway Company, a corporation existing under the laws of the State of Alabama, to construct a bridge over and across the Mobile River and its navigable channels above the city of Mobile, Alabama.

Feb. 27, 1911.
[H. R. 31538.]
[Public, No. 427.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Pensacola, Mobile and New Orleans Railway Company, a corporation existing under the laws of the State of Alabama, be, and is hereby, authorized to construct, operate and maintain a drawbridge and its approaches thereto, across the Mobile River, at a point in the county of Mobile suitable to the interests of navigation not further south than the north bank of the Chickasaw Creek at its mouth to be approved by the Secretary of War, in accordance with the provision of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Mobile River.
Pensacola, Mobile & New Orleans R. R. Co. may bridge above Mobile, Ala.

Vol. 34, p. 84.

SEC. 2. That the Act of Congress approved March twenty-sixth, nineteen hundred and eight, entitled "An Act to authorize the Pensacola, Mobile and New Orleans Railway Company, a corporation existing under the laws of the State of Alabama, to construct a bridge over and across the Mobile River and its navigable channels on a line approximately east of the north boundary line of the city of Mobile, Alabama," is hereby repealed.

Former act repealed.
Vol. 35, p. 49.

SEC. 3. That the right to alter, amend, and repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 27, 1911.

CHAP. 169.—An Act To authorize the board of supervisors of the town of Highlanding, Red Lake County, Minnesota, to construct a bridge across the Red Lake River.

Feb. 27, 1911.
[H. R. 32220.]
[Public, No. 428.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the board of supervisors of the town of Highlanding, Red Lake County, Minnesota, be, and they are hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Red Lake River at a point suitable to the interests of navigation, at or near section line between sections twenty-eight and twenty-nine, township one hundred and fifty-three north, range forty west, in the county of Red Lake, in the State of Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Red Lake River.
Highlanding, Minn., may bridge.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, February 27, 1911.

Feb. 27, 1911.
[H. R. 32341.]

[Public, No. 429.]

CHAP. 170.—An Act To authorize the Saint Paul Railway Promotion Company, a corporation, to construct a bridge across the Mississippi River, near Nininger, Minnesota.

Mississippi River.

St. Paul Ry. Promotion Co. may bridge, Nininger, Minn.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Saint Paul Railway Promotion Company, a corporation organized under the laws of Minnesota, its successors and assigns, are hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the Mississippi River, at a point suitable to the interests of navigation, at or near Nininger, in the County of Dakota, in the State of Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the constructon of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1911.

Feb. 27, 1911.
[H. R. 32400.]

[Public, No. 430.]

CHAP. 171.—An Act To authorize the North Pennsylvania Railroad Company and the Delaware and Bound Brook Railroad Company to construct a bridge across the Delaware River from Lower Makefield Township, Bucks County, Pennsylvania, to Ewing Township, Mercer County, New Jersey.

Delaware River.

Bridge authorized across, form Lower Makefield, Pa., to Ewing, N. J.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the North Pennsylvania Railroad Company and the Delaware and Bound Brook Railroad Company, their lessees, successors, and assigns, be, and they are hereby, authorized to construct, maintain, and operate a bridge and approaches thereto, across the Delaware River at a point suitable to the interests of navigation, from the township of Lower Makefield, county of Bucks, State of Pennsylvania, at or near the southeastern boundary of the borough of Yardley to a point at or near ten feet south of the existing bridge in the township of Ewing, in the county of Mercer, in the State of New Jersey, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, February 27, 1911.

Mar. 1, 1911.
[S. 10849.]

[Public, No. 434.]

CHAP. 185.—An Act To authorize the city of Shreveport to construct a bridge across Red River.

Red River.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the city of Shreveport, a corporation organized under the laws of the State of Louisiana, be, and is hereby, authorized to construct, maintain, and operate a traffic bridge and approaches thereto across the Red River at a point suitable to the interests of navigation, at Shreveport, in the State of Louisiana, in accordance with the provisions of the Act entitled "An Act to regulate the construction of a bridge over navigable waters," approved March twenty-third, nineteen hundred and six.

Shreveport, La., may bridge.

Vol. 34, p. 84.

Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 1, 1911.

CHAP. 186.—An Act To enable any State to cooperate with any other State or States, or with the United States, for the protection of the watersheds of navigable streams, and to appoint a commission for the acquisition of lands for the purpose of conserving the navigability of navigable rivers.

Mar. 1, 1911.
[H. R. 11798.]
[Public, No. 435.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the Congress of the United States is hereby given to each of the several States of the Union to enter into any agreement or compact, not in conflict with any law of the United States, with any other State or States for the purpose of conserving the forests and the water supply of the States entering into such agreement or compact.

Conservation of navigable waters, etc.
Agreement between States for, authorized.

Sec. 2. That the sum of two hundred thousand dollars is hereby appropriated and made available until expended, out of any moneys in the National Treasury not otherwise appropriated, to enable the Secretary of Agriculture to cooperate with any State or group of States, when requested to do so, in the protection from fire of the forested watersheds of navigable streams; and the Secretary of Agriculture is hereby authorized, and on such conditions as he deems wise, to stipulate and agree with any State or group of States to cooperate in the organization and maintenance of a system of fire protection on any private or state forest lands within such State or States and situated upon the watershed of a navigable river: *Provided*, That no such stipulation or agreement shall be made with any State which has not provided by law for a system of forest-fire protection: *Provided further*, That in no case shall the amount expended in any State exceed in any fiscal year the amount appropriated by that State for the same purpose during the same fiscal year.

Appropriation for cooperating with States for fire protection.

Forest lands on watersheds of navigable rivers.

Provisos.
State law required.

Expenditures limited.

Sec. 3. That there is hereby appropriated, for the fiscal year ending June thirtieth, nineteen hundred and ten, the sum of one million dollars, and for each fiscal year thereafter a sum not to exceed two million dollars for use in the examination, survey, and acquirement of lands located on the headwaters of navigable streams or those

Appropriations for acquiring, etc., lands at headwaters of navigable streams.

Proviso. Limited to 1915.

which are being or which may be developed for navigable purposes: *Provided*, That the provisions of this section shall expire by limitation on the thirtieth day of June, nineteen hundred and fifteen.

National Forest Reservation Commission. Members.

To pass on purchase of lands, etc.

Proviso. Service of members.

SEC. 4. That a commission, to be known as the National Forest Reservation Commission, consisting of the Secretary of War, the Secretary of the Interior, the Secretary of Agriculture, and two Members of the Senate, to be selected by the President of the Senate, and two Members of the House of Representatives, to be selected by the Speaker, is hereby created and authorized to consider and pass upon such lands as may be recommended for purchase as provided in section six of this Act, and to fix the price or prices at which such lands may be purchased, and no purchases shall be made of any lands until such lands have been duly approved for purchase by said commission: *Provided*, That the members of the commission herein created shall serve as such only during their incumbency in their respective official positions, and any vacancy on the commission shall be filled in the manner as the original appointment.

Annual reports.

SEC. 5. That the commission hereby appointed shall, through its president, annually report to Congress, not later than the first Monday in December, the operations and expenditures of the commission, in detail, during the preceding fiscal year.

Location of lands, etc.

Proviso. Examination by Geological Survey.

SEC. 6. That the Secretary of Agriculture is hereby authorized and directed to examine, locate, and recommend for purchase such lands as in his judgment may be necessary to the regulation of the flow of navigable streams, and to report to the National Forest Reservation Commission the results of such examinations: *Provided*, That before any lands are purchased by the National Forest Reservation Commission said lands shall be examined by the Geological Survey and a report made to the Secretary of Agriculture, showing that the control of such lands will promote or protect the navigation of streams on whose watersheds they lie.

Purchase of lands approved by commission.

Proviso. Consent of States.

SEC. 7. That the Secretary of Agriculture is hereby authorized to purchase, in the name of the United States, such lands as have been approved for purchase by the National Forest Reservation Commission at the price or prices fixed by said commission: *Provided*, That no deed or other instrument of conveyance shall be accepted or approved by the Secretary of Agriculture under this Act until the legislature of the State in which the land lies shall have consented to the acquisition of such land by the United States for the purpose of preserving the navigability of navigable streams.

Title, etc.

SEC. 8. That the Secretary of Agriculture may do all things necessary to secure the safe title in the United States to the lands to be acquired under this Act, but no payment shall be made for any such lands until the title shall be satisfactory to the Attorney-General and shall be vested in the United States.

Timber and mineral rights may be reserved.

SEC. 9. That such acquisition may in any case be conditioned upon the exception and reservation to the owner from whom title passes to the United States of the minerals and of the merchantable timber, or either or any part of them, within or upon such lands at the date of the conveyance, but in every case such exception and reservation and the time within which such timber shall be removed and the rules and regulations under which the cutting and removal of such timber and the mining and removal of such minerals shall be done shall be expressed in the written instrument of conveyance, and thereafter the mining, cutting, and removal of the minerals and timber so excepted and reserved shall be done only under and in obedience to the rules and regulations so expressed.

Regulations governing.

Sale of agricultural tracts not needed for public uses.

SEC. 10. That inasmuch as small areas of land chiefly valuable for agriculture may of necessity or by inadvertence be included in tracts acquired under this Act, the Secretary of Agriculture may, in his discretion, and he is hereby authorized, upon application or otherwise, to examine and ascertain the location and extent of such areas as in his opinion may be occupied for agricultural purposes without injury to the forests or to stream flow and which are not needed for public purposes, and may list and describe the same by metes and bounds, or otherwise, and offer them for sale as homesteads at their true value, to be fixed by him, to actual settlers, in tracts not exceeding eighty acres in area, under such joint rules and regulations as the Secretary of Agriculture and the Secretary of the Interior may prescribe; and in case of such sale the jurisdiction over the lands sold shall, ipso facto, revert to the State in which the lands sold lie. And no right, title, interest, or claim in or to any lands acquired under this Act, or the waters thereon, or the products, resources, or use thereof after such lands shall have been so acquired, shall be initiated or perfected, except as in this section provided.

Limit of tracts.

State jurisdiction resumed.

All rights, etc., subject to provisions of this act.

Lands reserved permanently as national forests.

SEC. 11. That, subject to the provisions of the last preceding section, the lands acquired under this Act shall be permanently reserved, held, and administered as national forest lands under the provisions of section twenty-four of the Act approved March third, eighteen hundred and ninety-one (volume twenty-six, Statutes at Large, page eleven hundred and three), and Acts supplemental to and amendatory thereof. And the Secretary of Agriculture may from time to time divide the lands acquired under this Act into such specific national forests and so designate the same as he may deem best for administrative purposes.

Vol. 26, p. 1103.

Designation of divisions.

State jurisdiction not affected.

SEC. 12. That the jurisdiction, both civil and criminal, over persons upon the lands acquired under this Act shall not be affected or changed by their permanent reservation and administration as national forest lands, except so far as the punishment of offenses against the United States is concerned, the intent and meaning of this section being that the State wherein such land is situated shall not, by reason of such reservation and administration, lose its jurisdiction nor the inhabitants thereof their rights and privileges as citizens or be absolved from their duties as citizens of the State.

Offenses against the United States excepted.

Payment from receipts to States for county schools and roads.

Sec. 13. That five per centum of all moneys received during any fiscal year from each national forest into which the lands acquired under this Act may from time to time be divided shall be paid, at the end of such year, by the Secretary of the Treasury to the State in which such national forest is situated, to be expended as the state legislature may prescribe for the benefit of the public schools and public roads of the county or counties in which such national forest is situated: *Provided*, That when any national forest is in more than one State or county the distributive share to each from the proceeds of such forest shall be proportional to its area therein: *Provided further*, That there shall not be paid to any State for any county an amount equal to more than forty percentum of the total income of such county from all other sources.

Provisos.
Division.

Maximum to counties.

Appropriation for expenses of commission.

Accounts.

Sec. 14. That a sum sufficient to pay the necessary expenses of the commission and its members, not to exceed an annual expenditure of twenty-five thousand dollars, is hereby appropriated out of any money in the Treasury not otherwise appropriated. Said appropriation shall be immediately available, and shall be paid out on the audit and order of the president of the said commission, which audit and order shall be conclusive and binding upon all departments as to the correctness of the accounts of said commission.

Approved, March 1, 1911.

Mar. 1, 1911.
[H. R. 23015.]
[Public, No. 436.]

CHAP. 187.—An Act To protect the dignity and honor of the uniform of the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That hereafter no proprietor, manager, or employee of a theater or other public place of entertainment or amusement in the District of Columbia, or in any Territory, the District of Alaska or Insular possession of the United States, shall make, or cause to be made, any discrimination against any person lawfully wearing the uniform of the Army, Navy, Revenue-Cutter Service or Marine Corps of the United States because of that uni-

Uniforms of United States.
Punishment for discriminations by theaters, etc., against wearers of.

form, and any person making, or causing to be made, such discrimination shall be guilty of a misdemeanor, punishable by a fine not exceeding five hundred dollars.

Approved, March 1, 1911.

CHAP. 188.—An Act Authorizing the Moline, East Moline and Watertown Railway Company to construct, maintain, and operate a bridge and approaches thereto across the South Branch of the Mississippi River from a point in the village of Watertown, Rock Island County, Illinois, to the island known as Campbells Island.

Mar. 1, 1911.
[H. R. 32440.]
[Public, No. 487.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Moline, East Moline and Watertown Railway Company, a corporation organized under the laws of the State of Illinois, is hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the South Branch of the Mississippi River from a point suitable to the interests of navigation in the village of Watertown, in the county of Rock Island and State of Illinois, to the island known as Campbells Island, in said county of Rock Island, said bridge to be a wagon and street railway bridge, whose use is to be free to the public, the same to be built in accordance with the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Mississippi River.
Moline, East Moline & Watertown Ry. Co. may bridge South Branch of, Watertown, Ill.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 1, 1911.

CHAP. 192.—An Act Making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and twelve, and for other purposes.

Mar. 2, 1911.
[H. R. 31856.]
[Public, No. 441.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the half of the following sums named, respectively, is hereby appropriated, out of any money in the Treasury not otherwise appropriated, and the other half out of the revenues of the District of Columbia, in full for the purposes following, being for the expenses of the government of the District of Columbia for the fiscal year ending June thirtieth, nineteen hundred and twelve, namely:

District of Columbia appropriations.
Half from District revenues.

GENERAL EXPENSES.

General expenses.

EXECUTIVE OFFICE: Two commissioners, at five thousand dollars each; engineer commissioner, two hundred and eighty dollars (to make salary five thousand dol-

Executive office.
Salaries of commissioners, etc.

Assistants to engineer commissioner. Vol. 20, p. 108.

lars); additional compensation for two assistants to the engineer commissioner, detailed from the Engineer Corps of the United States Army, under Act of Congress approved June eleventh, eighteen hundred and seventy-eight, two, at two hundred and fifty dollars each; * * *

* * * * *

Improvements and repairs.

IMPROVEMENTS AND REPAIRS.

* * * * *

Highway bridge.

Highway bridge across Potomac River: Two draw operators, at one thousand and twenty dollars each; draw operator, seven hundred and twenty dollars; four watchmen, at six hundred dollars each; labor, one thousand five hundred dollars; lighting, power, and miscellaneous supplies, and expenses of every kind necessarily incident to the operation and maintenance of the bridge and approaches, nine thousand three hundred and forty dollars; in all, sixteen thousand dollars.

* * * * *

Washington Aqueduct.

WASHINGTON AQUEDUCT.

Maintenance.

For operation, including salaries of all necessary employees, maintenance, and repair of the Washington Aqueduct and its accessories, including Conduit road, the McMillan Park reservoir, and Washington Aqueduct tunnel, and also including the purchase and maintenance of one motor truck, horses, vehicles, and harness, and the care and maintenance of the stable, thirty-three thousand dollars.

Filtration plant.

For care, including salaries of all necessary employees, maintenance, and operation of the Washington Aqueduct, District of Columbia, filtration plant, and the plant for the preliminary treatment of the water supply, and for each and every purpose connected therewith, ninety-one thousand dollars.

Emergency fund.

For emergency fund, to be used only in case of a serious break requiring immediate repair in one of the important aqueduct or filtration plant structures, such as a dam, conduit, tunnel, bridge, building, or important piece of machinery; all expenditures from this appropriation to be reported in detail to Congress, five thousand dollars.

McMillan Park Reservoir.

For continuation of parking grounds around McMillan Park reservoir, formerly known as Washington City reservoir, two thousand dollars.

Lining tunnels.

For beginning the lining of such portions of the unlined sections of the tunnels of the Washington Aqueduct as may be necessary to prevent leakage and the disintegration and fall of rock, eight thousand dollars.

Increasing water supply. Investigation of Patuxent River.

To complete the investigation and surveys for increasing the water supply by investigations and surveys to determine the availability and adaptability of the Patuxent River as a source of water supply for the District of Columbia, three thousand dollars.

Georgetown Reservoir.
Remodeling.

For beginning remodeling the Georgetown reservoir, Washington Aqueduct, to complete the works for the preliminary treatment of the water supply, and for each and every purpose connected therewith, fifty thousand dollars.

Cabin John Bridge.
Repair, etc.

For the preservation and repair of Cabin John Bridge, including the installation of a metal lining to prevent leakage in the portion of the Washington Aqueduct passing through the bridge, of which twenty thousand dollars shall be immediately available, thirty-five thousand dollars.

* * * * *

Anacostia River Flats.

ANACOSTIA RIVER FLATS.

Reclamation, etc.

Board of engineers in charge.

Toward the reclamation and development of the Anacostia River and Flats, from the Anacostia Bridge northeast to the District line, to be expended under the supervision of the Chief of Engineers, United States Army, upon plans to be prepared under the direction of, and to be approved by, a board of engineers to consist of the Engineer Commissioner of the District of Columbia, the officer in charge of public buildings and grounds, and the engineer officer in charge of the improvement of the Potomac River; said sum to be available for the preparation of plans, the prosecution of the work, the employment of personal service, and for such other purposes as may in the judgment of said board be necessary to carry out the purposes of this appropriation, one hundred thousand dollars.

Montrose Park.

MONTROSE PARK.

Procuring land for, on Georgetown Heights.
Vol. 36, p. 701.

Provisos.
Reimbursement from District revenues.

That the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to acquire for a park, by purchase or condemnation, the tract of land known as Montrose, lying immediately north of road or R Street and east of Lovers Lane, on Georgetown Heights, containing sixteen acres, more or less, at an expense not exceeding one hundred and ten thousand dollars; and for that purpose the sum of one hundred and ten thousand dollars, to be immediately available, is hereby appropriated, out of any money in the Treasury of the United States not otherwise appropriated: *Provided*, That one-half of the said sum of one hundred and ten thousand dollars, or so much thereof as may be expended, shall be reimbursed to the Treasury of the United States out of the revenues of the District of Columbia, in four equal annual installments, beginning with the fiscal year nineteen hundred and twelve, and with interest at the rate of three per centum per annum

Maintenance, etc.

Condemnation proceedings.

Vol. 30, p. 649.

Control, etc.

upon the deferred payments: *And provided further*, That one half of the sum that shall be annually appropriated and expended for the maintenance and improvement of said lands as a public park shall be charged against and paid out of the revenues of the District of Columbia, in the same manner now provided by law in respect to other appropriations for the District of Columbia, and the other half shall be appropriated out of the Treasury of the United States. If said commissioners shall be unable to purchase said land at a price not exceeding the sum of one hundred and ten thousand dollars, then they shall proceed to acquire said land in the manner prescribed for providing a site for an addition to the Government Printing Office in so much of the Act approved July first, eighteen hundred and ninety-eight, as is set forth on pages six hundred and forty-eight and six hundred and forty-nine of Volume XXX of the Statutes at Large, and for the purposes of said acquisition the Commissioners of the District of Columbia shall have and exercise all powers conferred upon the Public Printer in said Act: *Provided*, That the public park authorized and established by this Act shall become a part of the park system of the District of Columbia and be under the control of the Chief of Engineers of the United States Army.

* * * * *

Inconsistent laws repealed.

SEC. 10. That all laws and parts of laws to the extent that they are inconsistent with this act are repealed.

Approved, March 2, 1911.

Mar. 2, 1911.
[S. 10882.]

[Public, No. 445.]

CHAP. 196.—An Act To authorize the county of Ouachita, in the State of Arkansas, to construct a bridge across Ouachita River.

Ouachita River.

Ouachita County, Ark., may bridge, at Camden.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county of Ouachita, in the State of Arkansas, be, and is hereby, authorized to construct, maintain, and operate a traffic bridge and approaches thereto across the Ouachita River at Camden, Arkansas, in accordance with the provisions of the Act entitled "An Act to regulate the construction of a bridge over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 2, 1911.

CHAP. 209.—**An Act Making appropriations for the support of the Army for the fiscal year ending June thirtieth, nineteen hundred and twelve.**

Mar. 3, 1911.
[H. R. 31237.]
[Public, No. 453.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and they are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, for the support of the Army for the year ending June thirtieth, nineteen hundred and twelve:

Army appropriations.

CONTINGENCIES OF THE ARMY: For all contingent expenses of the Army not otherwise provided for, and embracing all branches of the military service, including the office of the Chief of Staff, to be expended under the immediate orders of the Secretary of War, forty thousand dollars.

Contingencies of the Army.

* * * * *

CORPS OF ENGINEERS.

Engineer battalion.

For pay of enlisted men, four hundred and seventy-six thousand nine hundred and seventy-six dollars.

Additional pay for length of service, sixty-five thousand dollars.

* * * * *

PAY TO CLERKS, MESSENGERS, AND LABORERS AT HEADQUARTERS OF DIVISIONS, AND DEPARTMENTS, AND POSTS COMMANDED BY GENERAL OFFICERS, AND OFFICE OF THE CHIEF OF STAFF.

Clerks, messengers, etc.

* * * * *

And said clerks, messengers, and laborers shall be employed and assigned by the Secretary of War to the offices and positions in which they are to serve: *Provided*, That no clerk, messenger, or laborer at headquarters of divisions, departments, posts commanded by general officers, or office of the Chief of Staff shall be assigned to duty with any bureau in the War Department.

Assignment.

Proviso.
Duty in War Department forbidden.

* * * * *

FOR PAY OF OFFICERS OF THE STAFF CORPS AND STAFF DEPARTMENTS.

Staff officers.

* * * * *

THE CORPS OF ENGINEERS: For pay of officers in the Corps of Engineers, four hundred and sixty thousand three hundred dollars.

Engineer Corps.

For additional pay to such officers for length of service, to be paid with their current monthly pay, one hundred and fourteen thousand two hundred and sixty dollars.

* * * * *

Miscellaneous.

MISCELLANEOUS.

* * * * *

Officer, buildings and grounds, D. C.

For additional pay to officer in charge of public buildings and grounds at Washington, District of Columbia, one thousand dollars.

* * * * *

Subsistence Department.

SUBSISTENCE DEPARTMENT.

* * * * *

Supplies to other bureaus, etc.

Rates.

To War Department bureaus.

Other departments, etc.

Provided, That hereafter when under the Army Regulations subsistence supplies are furnished to another bureau of the War Department, or to another executive department of the Government or employees thereof, payment therefor shall be made in cash by the proper disbursing officer of the bureau, office, or department concerned, or by the employee to whom the sale is made. When the transaction is between two bureaus of the War Department the price to be charged shall be the contract or invoice price of the supplies. When the transaction is between the Subsistence Department and another executive department of the Government or employees thereof, the price to be charged shall include the contract or invoice price and ten per centum additional to cover wastage in transit, and the cost of transportation.

* * * * *

Engineer Department.

ENGINEER DEPARTMENT.

Incidental expenses at depots.

ENGINEER DEPOTS: For incidental expenses for the depots, including fuel, lights, chemicals, stationery, hardware, machinery, pay of civilian clerks, mechanics, and laborers, extra-duty pay to soldiers necessarily employed for periods not less than ten days as artificers on work in addition to and not strictly in the line of their military duties, such as carpenters, blacksmiths, draftsmen, printers, lithographers, photographers, engine drivers, telegraph operators, teamsters, wheelwrights, masons, machinists, painters, overseers, laborers; for lumber and materials and for labor for packing and crating engineer supplies; repairs of, and for materials to repair, public buildings, machinery, and unforseen expenses, twenty thousand dollars.

Purchase, etc., of instruments.

For purchase and repair of instruments to be issued to officers of the Corps of Engineers and to officers detailed and on duty as acting engineer officers for use on public works and surveys, ten thousand dollars.

Engineer School, Washington Barracks, D. C.

Equipment.

ENGINEER SCHOOL, WASHINGTON, DISTRICT OF COLUMBIA: Equipment and maintenance of the Engineer School at Washington Barracks, District of Columbia, including purchase of instruments, machinery, implements, models, and materials, for the use of the school and for instruction of engineer troops in their special duties as sappers and miners; for land mining, pontoniering, and signaling; for purchase and binding of professional works and periodicals of recent date treating of military and civil engineering and kindred scientific subjects for the library of the United States Engineer School; for incidental expenses of the school, including fuel, lights, chemicals, stationery, hardware, machinery, and boats; for pay of civilian clerks, draftsmen, electricians, mechanics, and laborers; compensation of civilian lecturers and payment of tuition fees of student officers at civil technical institutions; for extra-duty pay to soldiers necessarily employed for periods not less than ten days as artificers on work in addition to and not strictly in the line of their military duties, such as carpenters, blacksmiths, draftsmen, printers, lithographers, photographers, engine drivers, telegraph operators, telephone operators, teamsters, wheelwrights, masons, machinists, painters, overseers, laborers; for repairs of and materials to repair public buildings and machinery; for unforseen expenses; for travel expenses of officers on journeys approved by the Secretary of War and made for the purpose of instruction: *Provided*, That the traveling expenses herein provided for shall be in lieu of mileage and other allowances; and to provide means for the theoretical and practical instruction at the Engineer School by the purchase of text-books, books of reference, scientific and professional papers, and for other absolutely necessary expenses, twenty-five thousand dollars.

Incidental expenses.

Travel expenses.

Proviso. In lieu of mileage.

Text-books, etc.

ENGINEER EQUIPMENT OF TROOPS: For pontoon material, tools, instruments, and supplies required for use in the engineer equipment of troops, including the purchase and preparation of engineer manuals, seventy-five thousand dollars.

Pontoon material, etc.

For construction of pontoon shed at Washington Barracks, District of Columbia, for shelter for new pontoon and bridge material, which has heretofore been stored in the open air, fifteen thousand dollars.

Pontoon shed.

CIVILIAN ASSISTANTS TO ENGINEER OFFICERS: For services of surveyors, survey parties, draftsmen, photographers, master laborers, and clerks to engineer officers on the staff of division, corps, and department commanders, forty-two thousand dollars.

Surveyors, etc.

CONTINGENCIES, ENGINEER DEPARTMENT, PHILIPPINE ISLANDS: For contingent expenses incident to the operations of the Engineer Department in the Philippine Islands, to be expended at the discretion of the Secretary of War, five thousand dollars.

Philippine Islands. Contingencies.

Hereafter whenever pressing obligations are required to be paid by a disbursing officer of the Engineer Department and there is an insufficient balance to his official credit under the proper appropriation or appropriations

Payment of pressing obligations from available balances.

for the purpose, he is authorized to make payment from the total available balance to his official credit, provided sufficient funds under the proper appropriation or appropriations have been allotted by the Chief of Engineers for the expenditure. When such disbursements are made the accounts of the disbursing officer shall show the charging of the proper appropriations, the balances under which will be adjusted by the disbursing officer on receipt of funds or by the accounting officers of the Treasury.

Adjustment.

* * * * *

Line officers.
Promotion to rank lost by regimental promotion.

On and after the passage of this Act, every line officer on the active list below the grade of colonel who has lost in lineal rank through the system of regimental promotion in force prior to October first, eighteen hundred and ninety, may, in the discretion of the President, and subject to examination for promotion as prescribed by law, be advanced to higher grades in his arm up to and including the grade of colonel, in accordance with the rank he would have been entitled to hold had promotion been lineal throughout his arm or corps since the date of his entry into the arm or corps to which he permanently belongs: *Provided*, That officers advanced to higher grades under the provisions of this Act shall be additional officers in those grades: *Provided further*, That nothing in this Act shall operate to interfere with or retard the promotion to which any officer would be entitled under existing law: *And provided further*, That the officers advanced to higher grades under this Act shall be junior to the officers who now rank them under existing law, when these officers have reached the same grade.

Provisos.
To be additional numbers.
Not to affect promotions under existing law.
Status of officers advanced.

Approved, March 3, 1911.

Mar. 3, 1911.
[S. 5843.]
[Public, No. 456.]

CHAP. 212.—An Act To authorize the extension of Van Buren Street northwest.

District of Columbia.
Van Buren Street NW.
Condemning land for extending.
Vol. 34, p. 151.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That under and in accordance with the provisions of subchapter one of chapter fifteen of the Code of Law for the District of Columbia, within six months after the passage of this Act, the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to institute in the supreme court of the District of Columbia a proceeding in rem to condemn the land that may be necessary for the extension of Van Buren Street, northwest, from Piney Branch Road to its present western terminus, east of Third Street, northwest, with a width of sixty feet according to the plans for the permanent system of highways of the District of Columbia:

Provisos.
Damages assessed as benefits.
Minimum assessment.

Provided, however, That the entire amount found to be due and awarded by the jury in said proceeding as damages for and in respect of the land to be condemned for said extension, plus the costs and expenses of said proceeding, shall be assessed by the jury as benefits: *And provided further*, That nothing in said subchapter one of chapter fifteen of said code shall be construed to authorize the jury to assess less than the aggregate amount of the damages awarded for and in respect of the land to be condemned and the costs and expenses of the proceeding hereunder.

Appropriation for expenses.
Payment of awards.

SEC. 2. That there is hereby authorized to be expended, from the revenues of the District of Columbia, an amount sufficient to pay the necessary costs and expenses of the condemnation proceedings taken pursuant hereto and for the payment of amounts awarded as damages; to be repaid to the District of Columbia from the assessments for benefits and covered into the Treasury to the credit of the revenues of the District of Columbia.

Approved, March 3, 1911.

Mar. 3, 1911.
[S. 10808.]
[Public, No. 464.]

CHAP. 220.—An Act To authorize the Greeley-Arizona Irrigation Company to build a dam across the Colorado River at or near Head Gate Rock, near Parker, in Yuma County, Arizona.

Colorado River.
Greeley-Arizona Irrigation Co. may dam, near Parker, Ariz.
Vol. 36, p. 593.
Vol. 34, p. 386.
Provisos.
Time of construction.
Approval of plans, etc.
Vol. 36, p. 593.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Greeley-Arizona Irrigation Company, a corporation organized under the laws of Arizona, is hereby authorized to construct, maintain, and operate a diversion dam in and across the Colorado River at a place known as Head Gate Rock, near Parker, Yuma County, in the Territory of Arizona, in accordance with the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six": *Provided*, That the actual construction of said dam shall be begun within two years and completed within four years from the date of the passage of this Act: *And provided further*, That the actual construction of said dam shall not be commenced until the plans and specifications therefor shall have been presented to and approved by the Secretary of the Interior in addition to the requirements of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six," and, in approving the plans and specifications, the Secretary of the Interior may impose such conditions as to him shall seem proper for the protection of the public interests of Indians and the United States.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is expressly reserved.

Approved, March 3, 1911.

Mar. 3, 1911.
[S. 10822.]

[Public, No. 465.]

CHAP. 221.—An Act To extend the time for the completion of a bridge across the Missouri River at or near Yankton, South Dakota, by the Winnipeg, Yankton and Gulf Railroad Company.

Missouri River.
Time extended for bridging, at Yankton, S. Dak., by Winnipeg, Yankton & Gulf R. R. Co.
Vol. 33, p. 157.
Vol. 36, p. 186.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of the Act approved April fifth, nineteen hundred and four, authorizing the Winnipeg, Yankton and Gulf Railroad Company to construct a combined railroad, wagon, and foot-passenger bridge across the Missouri River at or near the city of Yankton, South Dakota, as amended by the Act approved January twenty-sixth, nineteen hundred and ten, be, and the same is hereby, so amended that the time within which the said bridge is required to be commenced shall be within one year and the time within which it is required that the said bridge shall be completed shall be within three years from the date of the approval of this Act.

Approved, March 3, 1911.

Mar. 3, 1911.
[S. 10883.]

[Public, No. 466.]

CHAP. 222.—An Act Authorizing the Erie Railroad Company to construct a canal connecting the Hackensack River and Berrys Creek, Bergen County, New Jersey, as an aid to navigation, and for other purposes.

Berrys Creek, N. J.
Erie R. R. Co. may construct canal to Hackensack River from.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Erie Railroad Company, a corporation of the State of New York, its successors and assigns, is hereby authorized, for the purpose of removing perils and delays now incident to the navigation of Berrys Creek, in the county of Bergen and State of New Jersey, through the presence of the bridge of the said Erie Railroad Company across said creek at a distance of about eight thousand seven hundred feet from the point where said creek empties into the Hackensack River and of improving the navigation of said Berrys Creek, to construct a suitable canal, from a point in the center of Berrys Creek, northeast of the bridge of the Erie Railroad Company over said stream, to and into the Hackensack River:

Location.

Proviso.
Approval of plans.

Provided, That no canal shall be constructed under this authority unless the plans for the same are approved by the Corps of Engineers and the Secretary of War, who are authorized to impose such conditions as may be necessary to maintain the navigability of Berrys Creek unimpaired. And if said railroad company shall construct said canal to the approval of the Secretary of War, said railroad company shall be authorized and permitted to maintain a fixed bridge over Berrys Creek at a point where the main line of the railroad company now crosses said creek.

Change in bridge permitted.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 3, 1911.

CHAP. 226.—An Act To prevent the disclosure of national defense secrets.

Mar. 3, 1911.
[H. R. 26656.]

[Public, No. 470.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That whoever, for the purpose of obtaining information respecting the national defense, to which he is not lawfully entitled, goes upon any vessel, or enters any navy-yard, naval station, fort, battery, torpedo station, arsenal, camp, factory, building, office, or other place connected with the national defense, owned or constructed or in process of construction by the United States, or in the possession or under the control of the United States or any of its authorities or agents, and whether situated within the United States or in any place noncontiguous to but subject to the jurisdiction thereof; or whoever, when lawfully or unlawfully upon any vessel, or in or near any such place, without proper authority, obtains, takes, or makes, or attempts to obtain, take, or make, any document, sketch, photograph, photographic negative, plan, model, or knowledge of anything connected with the national defense to which he is not entitled; or whoever, without proper authority, receives or obtains, or undertakes or agrees to receive or obtain, from any person, any such document, sketch, photograph, photographic negative, plan, model, or knowledge, knowing the same to have been so obtained, taken, or made; or whoever, having possession of or control over any such document, sketch, photograph, photographic negative, plan, model, or knowledge, willfully and without proper authority, communicates or attempts to communicate the same to any person not entitled to receive it, or to whom the same ought not, in the interest of the national defense, be communicated at that time; or whoever, being lawfully intrusted with any such document, sketch, photograph, photographic negative, plan, model, or knowledge, willfully and in breach of his trust, so communicates or attempts to communicate the same, shall be fined not more than one thousand dollars, or imprisoned not more than one year, or both.

National defense.
Offenses specified.
Obtaining unlawful information.

Obtaining photographs, sketches, plans, etc.

Receiving unlawful information.

Communicating information.

Disclosing plans.

Punishment.

SEC. 2. That whoever, having committed any offense defined in the preceding section, communicates or attempts to communicate to any foreign government, or to

Punishment for communication to foreign governments, etc.

any agent or employee thereof, any document, sketch, photograph, photographic negative, plan, model, or knowledge so obtained, taken, or made, or so intrusted to him, shall be imprisoned not more than ten years.

Jurisdiction for offenses on high seas.

SEC. 3. That offenses against the provisions of this Act committed upon the high seas or elsewhere outside of a judicial district shall be cognizable in the district where the offender is found or into which he is first brought; but offenses hereunder committed within the Philippine Islands shall be cognizable in any court of said islands having original jurisdiction of criminal cases, with the same right of appeal as is given in other criminal cases where imprisonment exceeding one year forms a part of the penalty; and jurisdiction is hereby conferred upon such courts for such purpose.

In the Philippines.

Approved, March 3, 1911.

Mar. 3, 1911.
[H. R. 31239.]

[Public, No. 473.]

CHAP. 229.—An Act To authorize Park C. Abell, George B. Lloyd, and Andrew B. Sullivan, of Indian Head, Charles County, Maryland, to construct a bridge across the Mattawoman Creek, near the village of Indian Head, Maryland.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Park C. Abell, George B. Lloyd, and Andrew B. Sullivan, of Indian Head, Charles County, Maryland, and their assigns, are hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the Mattawoman Creek, at a point suitable to the interests of navigation, at or near the village of Indian Head, in the County of Charles, in the State of Maryland, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Mattawoman Creek.
Park C. Abell et al. may bridge, at Indian Head, Md.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 3, 1911.

Mar. 3, 1911.
[H. R. 18512.]

[Private, No. 252.]

CHAP. 234.—An Act For the relief of S. H. Robinson, of Allegheny County, Pennsylvania.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized and directed to pay, out of any money in the Treasury of the United States not otherwise appropriated, to S. H. Robinson, of Allegheny County, Pennsylvania, the sum of twenty-six thousand nine hundred and eighty-five dollars and sixty-three cents, as compensation for the injury sustained by him because of a flood in the Allegheny River in January, nineteen hun-

S. H. Robinson.
Payment to.

dred and seven, and being the amount recommended to be paid him by the Chief of Engineers, United States Army.

Approved, March 3, 1911.

Mar. 4, 1911.
[H. R. 29360.]
[Public, No. 477.]

CHAP. 237.—An Act Making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and twelve, and for other purposes.

Legislative, executive, and judicial appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, in full compensation for the service of the fiscal year ending June thirtieth, nineteen hundred and twelve, for the objects hereinafter expressed namely:

* * * * *

War Department.

WAR DEPARTMENT.

* * * * *

Engineer Office.

Office of the Chief of Engineers: Chief clerk, two thousand dollars; two chiefs of division, at two thousand dollars each; eight clerks of class four; eleven clerks of class three; twelve clerks of class two; fifteen clerks of class one; nine clerks, at one thousand dollars each; eleven clerks, at nine hundred dollars each; six messengers; three assistant messengers; and two laborers; in all, one hundred thousand two hundred and twenty dollars.

Skilled draftsmen, etc.

And the services of skilled draftsmen, civil engineers, and such other services as the Secretary of War may deem necessary, may be employed only in the office of the Chief of Engineers, to carry into effect the various appropriations for rivers and harbors, fortifications, and surveys, to be paid from such appropriations: *Provided*, That the expenditures on this account for the fiscal year nineteen hundred and twelve shall not exceed forty-two thousand dollars; and that the Secretary of War shall each year, in the annual estimates, report to Congress the number of persons so employed, their duties, and the amount paid to each.

Proviso.
Limit, etc.

* * * * *

Public buildings and grounds.

PUBLIC BUILDINGS AND GROUNDS.

Superintendent, assistant, clerks, etc.

Office of public buildings and grounds: Superintendent, three thousand dollars; assistant and chief clerk, two thousand four hundred dollars; clerk of class four; clerk of class three; clerk and stenographer, one thousand four hundred dollars; clerk of class one; messenger; landscape architect, two thousand four hundred dollars; surveyor and draftsman, one thousand five hundred dollars; in all, sixteen thousand one hundred and forty dollars.

Foremen, etc.

For foremen, gardeners, mechanics, and laborers employed in the public grounds, thirty-one thousand two hundred dollars.

Watchmen.

For one sergeant of park watchmen, nine hundred and fifty dollars.

For second sergeant of park watchmen, nine hundred dollars.

Day force.

For day watchmen, as follows: One in Franklin Park and adjacent reservations on New York avenue; one in Lafayette Park; two in Smithsonian Grounds and neighboring reservations; one in Judiciary Park; one in Lincoln Park and adjacent reservations; one in Iowa Circle and reservations to the northwest; one in Thomas and Scott circles and neighboring reservations; one in Washington Circle and neighboring reservations; one in Dupont Circle and neighboring reservations; one in McPherson Park and Farragut Square; one in Stanton Park and neighboring reservations; two in Henry and Seaton parks and neighboring reservations; one in Mount Vernon Park and reservations to the northeast; one in grounds south of the Executive Mansion; one in Garfield and Marion parks and reservations to the east; one in Monument Park; and three in Potomac Park; twenty-one in all, at seven hundred and twenty dollars each, fifteen thousand one hundred and twenty dollars.

Night force.

For night watchmen, as follows: Two in Smithsonian Grounds and neighboring reservations; one in Judiciary Park; two in Henry and Seaton parks and adjacent reservations; one in grounds south of the Executive Mansion; one in Monument Park; one in Garfield Park and neighboring reservations; one in Iowa, Scott, and Thomas Circles and neighboring reservations; one in Stanton and Lincoln Parks and neighboring reservations; one in Lafayette and McPherson Squares and Franklin and Farragut Parks; one in Washington and Dupont Circles and neighboring reservations; one in Mount Vernon Park and neighboring reservations; two for greenhouses and nursery; and four in Potomac Park; nineteen in all, at seven hundred and twenty dollars each, thirteen thousand six hundred and eighty dollars.

Wakefield, Va.

For watchman for the care of the monument and dock at Wakefield, Virginia, the birthplace of Washington, three hundred dollars.

Contingent expenses.

For contingent and incidental expenses, including purchase of professional and scientific books and periodicals, books of reference, blank books, photographs, and maps, seven hundred dollars.

For purchase and repair of bicycles and revolvers for park watchmen and for purchase of ammunition, one thousand dollars.

Uniforms.

For purchasing and supplying uniforms to park, Monument, and bridge watchmen, two thousand eight hundred dollars.

Amount from District revenues.

Of the foregoing amounts appropriated under Public Buildings and Grounds, the sum of thirty-three thousand one hundred and seventy-five dollars shall be paid out of the revenues of the District of Columbia.

State, War, and Navy Department Building.

STATE, WAR, AND NAVY DEPARTMENT BUILDING.

Clerks, engineers, watchmen, etc.

Office of the superintendent: Clerk of class three; stenographer and typewriter, nine hundred dollars; chief engineer, one thousand four hundred dollars; five assistant engineers, at one thousand dollars each; electrical machinist, one thousand two hundred dollars; captain of the watch, one thousand two hundred dollars; two lieutenants of the watch, at eight hundred and forty dollars each; forty-nine watchmen; carpenter, one thousand dollars; electrician, one thousand two hundred dollars; machinist, painter, and plumber, at one thousand dollars each; three dynamo tenders, at nine hundred dollars each; seven skilled laborers or mechanics, at eight hundred and forty dollars each; messenger; foreman of laborers, eight hundred and forty dollars; ten firemen; eleven conductors of elevators, at seven hundred and twenty dollars each; seventeen laborers; three second-class firemen, at six hundred and sixty dollars each; four forewomen of charwomen, at three hundred dollars each; seventy-seven charwomen; gardener, seven hundred and twenty dollars; in all, one hundred and twelve thousand four hundred and forty dollars.

Fuel, lights, etc., Mills Building.

For fuel, lights, repairs, and miscellaneous items, and city directories, thirty-two thousand dollars.

NAVY DEPARTMENT ANNEX, MILLS BUILDING: Engineer, one thousand two hundred dollars; four firemen; two elevator conductors, at seven hundred and twenty dollars each; five watchmen; four laborers; one forewoman, three hundred dollars; nine charwomen; in all, fourteen thousand two hundred and twenty dollars.

For repairs, supplies, and miscellaneous articles, Mills Building (Navy Department Annex), two thousand dollars.

State Department Annex.

STATE DEPARTMENT ANNEX: Laborer, six hundred and sixty dollars.

* * * * *

Pay of switchboard operators, assistant messengers, laborers, etc., rated.

SEC. 2. The pay of telephone-switchboard operators, assistant messengers, firemen, watchmen, laborers, and charwomen provided for in this Act, except those employed in mints and assay offices, unless otherwise specially stated, shall be as follows: For telephone-switchboard operators, assistant messengers, firemen, and watchmen, at the rate of seven hundred and twenty dollars per annum each; for laborers, at the rate of six hundred and sixty dollars per annum each; assistant telephone-switchboard operators, at the rate of six hundred dollars each, and for charwomen, at the rate of two hundred and forty dollars per annum each.

No pay for permanently disabled persons.

SEC. 3. That the appropriations herein made for the officers, clerks, and persons employed in the public service shall not be available for the compensation of any persons incapacitated otherwise than temporarily for performing such service, and the heads of departments shall cause this provision to be enforced.

Inconsistent laws repealed.

SEC. 4. That all laws or parts of laws inconsistent with this Act are repealed.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 32212.]
[Public, No. 479.]

CHAP. 239.—An Act Making appropriations for the naval service for the fiscal year ending June thirtieth, nineteen hundred and twelve, and for other purposes.

Naval service appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and they are hereby, appropriated, to be paid out of any money in the Treasury not otherwise appropriated, for the naval service of the Government for the year ending June thirtieth, nineteen hundred and twelve, and for other purposes.

* * * * *

Public works.

PUBLIC WORKS, BUREAU OF YARDS AND DOCKS.

Portsmouth, N. H.

NAVY YARD, PORTSMOUTH, NEW HAMPSHIRE: Combined railway and highway bridge, with approach and appurtenances (cost not to exceed one hundred and twenty-five thousand dollars), one hundred and twenty-five thousand dollars; railroad rolling stock, additional, four thousand dollars; for continuing the extension of the quay wall, one hundred thousand dollars; in all, two hundred and twenty-nine thousand dollars.

* * * * *

Mare Island, Cal.

Improving hydraulics.

Proviso.
Contracts authorized.

NAVY YARD, MARE ISLAND, CALIFORNIA: Improvement of hydraulics, Mare Island straits, and so forth, in accordance with the report submitted in House Document Numbered Eleven hundred and three, Sixtieth Congress, second session, three hundred thousand dollars: *Provided*, That the Secretary of the Navy may enter into a contract or contracts for such materials and work as may be necessary to complete the project, to be paid for as appropriations may, from time to time, be made by law, not to exceed in the aggregate five hundred and seven thousand dollars; * * *.

* * * * *

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 32957.]
[Public, No. 480.]

CHAP. 240.—An Act Making appropriations to supply deficiencies in appropriations for the fiscal year nineteen hundred and eleven and for prior years, and for other purposes.

Deficiencies appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, to supply deficiencies in appropriations for the fiscal year nineteen hundred and eleven and for prior years, and for other purposes, namely:

* * * * *

TREASURY DEPARTMENT.

Treasury Department.

* * * * *

MISCELLANEOUS TREASURY DEPARTMENT.

Miscellaneous.

* * * * *

William C. Langfitt.
Credit in accounts.

The accounting officers of the Treasury are hereby authorized and directed to allow and credit in the accounts of Lieutenant Colonel William C. Langfitt, Corps of Engineers, the sum of one hundred and eighty-two dollars, disallowed against him on the books of the Treasury.

The accounting officers of the Treasury are hereby authorized and directed to allow and credit in the accounts of Lieutenant Colonel William C. Langfitt, Corps of Engineers, the sum of one hundred dollars, disallowed against him on the books of the Treasury.

* * * * *

New Hampshire.
Payment for land, etc.

To pay to the State of New Hampshire for land and fort in Portsmouth Harbor ceded to the United States, twelve thousand dollars.

* * * * *

MILITARY ESTABLISHMENT.

War Department.

* * * * *

RIVER AND HARBOR WORK.

Rivers and harbors.

Paying claims for collisions, etc.
Vol. 36, p. 676.

To pay claims adjusted and settled under section four of the river and harbor appropriation Act, approved June twenty-fifth, nineteen hundred and ten, and certified to Congress in House Document Numbered Twelve hundred and forty-nine at the present session, four hundred and nineteen dollars and eighty cents.

Indiana Harbor, Ind.
Inner harbor maintenance.

Indiana Harbor, Indiana: So much as may be necessary of the unexpended balance of the appropriation heretofore made for the improvement of the harbor at Indiana Harbor, Indiana, is hereby made available, in the discretion of the Secretary of War, for the maintenance of the inner harbor, in accordance with the provisions of House Document Numbered One thousand one hundred and thirteen, Sixtieth Congress, second session.

Union River, Me. Removing bowlders.

Authority is hereby given the Secretary of War, in his discretion, to apply any unexpended balance for Union River, Maine, of appropriation for improving said river and allotments for the same from apropriation "Preservation and maintenance of river and harbor works," to removing obstructive bowlders and ledge along said river above the limits of the existing project.

* * * * *

Meridian Hill Park, D. C. Condemnation expenses. Vol. 36, p. 700.

MERIDIAN HILL PARK.

Condemnation of land for park purposes in the District of Columbia included between Euclid Street, Columbia Avenue or Fifteenth Street, W Street or Florida Avenue, and Sixteenth Street extended, in Hall and Elvan's subdivision of Meridian Hill: To enable the Secretary of the Interior to carry into effect the provisions of section thirty-six of an Act of Congress entitled "An Act to increase the limit of cost of certain public buildings, to authorize the enlargement, extension, remodeling, or improvement of certain public buildings, to authorize the erection and completion of public buildings, to authorize the purchase of sites for public buildings, and for other purposes," four hundred and ninety thousand dollars, or so much thereof as may be necessary; one-half of which sum, or so much thereof as may be expended, shall be reimbursed to the Treasury of the United States, as required in said section thirty-six, out of the revenues of the District of Columbia, in four equal annual installments, beginning with the fiscal year nineteen hundred and twelve, with interest at the rate of three per centum per annum upon the deferred payments.

* * * * *

CLAIMS ALLOWED BY THE AUDITOR FOR THE WAR DEPARTMENT.

* * * * *

For Engineer School, Washington, District of Columbia, two hundred and eighty-two dollars and seventy-two cents.

* * * * *

Approved, March 4, 1911.

Mar. 4, 1911. [H. R. 32865.] [Public, No. 482.]

CHAP. 242.—An Act Making appropriations for fortifications and other works of defense, for the armament thereof, for the procurement of heavy ordnance for trial and service, and for other purposes.

Fortifications appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the sums of money herein provided for be, and the same are hereby, appropriated, out of any money in the Treasury not otherwise appropriated, to be available until expended, namely:

FORTIFICATIONS AND OTHER WORKS OF DEFENSE.

UNDER THE ENGINEER DEPARTMENT.

Engineer Department.

Fire-control stations.

For construction of fire-control stations and accessories, including purchase of lands and rights of way, and for the purchase and installation of necessary lines and means of electrical communication, including telephones, dial and other telegraphs, wiring and all special instruments, apparatus, and materials, coast signal apparatus, and salaries of electrical experts, engineers, and other necessary employees connected with the use of coast artillery; for the purchase, manufacture, and test of range finders and other instruments for fire control at the fortifications, and the machinery necessary for their manufacture at the arsenals, one hundred thousand dollars.

Range finders, etc.

Power plants.

For installation and replacement of electric light and power plants at seacoast fortifications, fifty thousand dollars.

Searchlights.

For purchase and installation of searchlights for the defenses of our most important harbors, fifty thousand dollars.

Preservation, etc.

For the protection, preservation, and repair of fortifications for which there may be no special appropriation available, three hundred thousand dollars.

Plans.

For preparation of plans for fortifications, five thousand dollars.

Electric plants.

For tools, electrical and engine supplies and appliances, to be furnished by the Engineer Department, for the use of the troops for maintaining and operating electric light and power plants in gun and mortar batteries, forty-five thousand dollars.

Torpedo structures.

For preservation and repair of structures erected for the torpedo defense of the United States, twenty thousand dollars.

Submarine mines.

Care, etc.

Construction of mining casemates, cable galleries, torpedo storehouses, cable tanks, and other structures necessary for the operation, preservation, and care of submarine mines and their accessories, fifty thousand dollars.

* * * * *

FORTIFICATIONS IN INSULAR POSSESSIONS.

Insular possessions.

ENGINEER DEPARTMENT.

Engineer Department.

Seacoast batteries.

For construction of seacoast batteries, as follows:

Hawaiian Islands.

In the Hawaiian Islands, one hundred and fifty thousand dollars;

Philippine Islands.

In the Philippine Islands, one million one hundred and sixty-nine thousand dollars;

In all, one million three hundred and nineteen thousand dollars.

Electric plants.

For installation of light and power plants at the defenses of the following localities:

Philippine Islands.

In the Philippine Islands, one hundred and seventy-one thousand nine hundred and sixty-two dollars.

Searchlights.

For purchase and installation of searchlights for the defenses of most important harbors, as follows:

Hawaiian Islands.

In the Hawaiian Islands, forty thousand one hundred dollars.

Preservation, etc.

For protection, preservation, and repair of fortifications at the following localities:

Philippine Islands.

In the Philippine Islands, seven thousand dollars.

Torpedo structures.

For preservation and repair of structures erected for torpedo defense at the following localities:

Philippine Islands.

In the Philippine Islands, one thousand dollars.

Operating power plants.

For tools, electrical and other supplies and appliances, to be furnished by the Engineer Department for the use of the troops for maintaining and operating gun and mortar batteries—

In the Hawaiian Islands, one thousand dollars.

In the Philippine Islands, two thousand five hundred dollars.

Land defenses, Philippines.

For land defenses, Philippine Islands, one hundred and eighty thousand dollars.

* * * * *

Board of Ordnance and Fortification.

BOARD OF ORDNANCE AND FORTIFICATION.

Purchases, etc.

To enable the board to make all needful and proper purchases, experiments, and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implements and engines of war, and to purchase or cause to be manufactured, under authority of the Secretary of War, such guns, carriages, armor plates, and other war material as may, in the judgment of the board, be necessary in the proper discharge of the duty devolved upon it by the Act approved September twenty-second, eighteen hundred and eighty-eight; to pay the salary of the civilian member of the Board of Ordnance and Fortification provided by the Act of February twenty-fourth, eighteen hundred and ninety-one, and for the necessary traveling expenses of said member when traveling on duty as contemplated in said Act; for the payment of the necessary expenses of the board, including a pier diem allowance to each officer detailed to serve thereon, when employed on duty away from his permanent station, of two dollars and fifty cents a day; and for the test of experimental guns, carriages, and other devices procured in accordance with the recommendation of the Board of Ordnance and Fortification, twenty-five thousand dollars, the expenditure of which shall be made by the several bureaus of the War Department heretofore having jurisdic-

Vol. 25, p. 489.

Civilian member.

Vol. 26, p. 769.

Per diem, etc.

tion of the same, or by the board itself, as the Secretary of War may direct: *Provided*, That before any money shall be expended in the construction or test of any gun, gun carriage, ammunition, or implements under the supervision of the said board, the board shall be satisfied, after due inquiry, that the Government of the United States has a lawful right to use the inventions involved in the construction of such gun, gun carriage, ammunition, or implements, or that the construction or test is made at the request of a person either having such lawful right or authorized to convey the same to the Government.

Proviso.
Right to use inventions.

Approved, March 4, 1911.

CHAP. 244.—An Act For the erection of a monument over the grave of President John Tyler.

Mar. 4, 1911.
[S. 8662.]
[Public, No. 484.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he is hereby, authorized and directed to cause a suitable monument to be erected over the grave of the late John Tyler, former President of the United States, in Hollywood Cemetery, Richmond, Virginia, not to exceed in cost the som of ten thousand dollars.

President John Tyler.
Monument authorized over grave of.
Cost.

Approved, March 4, 1911.

CHAP. 249.—An Act To authorize the extension of Seventeenth Street northeast.

Mar. 4, 1911.
[S. 8300.]
[Public, No. 489.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That under and in accordance with the provisions of subchapter one of chapter fifteen of the Code of Law for the District of Columbia, within six months after the passage of this Act, the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to institute in the supreme court of the District of Columbia a proceeding in rem to condemn the land that may be necessary for the extension of Seventeenth street northeast from Brentwood road to Rhode Island avenue, according to the permanent system of highway plans adopted in and for the District of Columbia: *Provided, however*, That the entire amount found to be due and awarded by the jury in said proceedings as damages for and in respect of the land to be condemned for said extension shall be assessed by the jury as benefits: *And provided further*, That nothing in said subchapter one of chapter fifteen of said code shall be construed to authorize the jury to assess less than the aggregate amount of the damages awarded for and in

District of Columbia.
Seventeenth Street NE.
Condemning land for extending.
Vol. 34, p. 151.
Provisos.
Damages assessed as benefits.
Minimum assessment.

respect of the land to be condemned and the costs and expenses of the proceedings hereunder.

Appropriations for expenses, etc.

Awards.

SEC. 2. That there is hereby appropriated from the revenues of the District of Columbia an amount sufficient to pay the necessary costs and expenses of the condemnation proceedings taken pursuant hereto and for the payment of amounts awarded as damages, to be repaid to the District of Columbia from the assessments for benefits and covered into the Treasury to the credit of the revenues of the District of Columbia.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 9094.]

[Public, No. 491.]

CHAP. 251.—An Act To authorize the Secretary of War to sell to the Nahant and Lynn Steet Railway Company a portion of the United States coast defense military reservation at Nahant, Massachusetts.

Nahant Military Reservation, Mass.
Sale of strip to Nahant & Lynn Street Ry. Co.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War, for and on behalf of the United States, is hereby authorized to grant and convey by deed to the Nahant and Lynn Street Railway Company, a corporation duly organized under the laws of the Commonwealth of Massachusetts, a strip of land sixteen feet wide lying along the northerly and westerly sides of the military reservation at Nahant, Massachusetts, and abutting upon Flash Road and upon Castle Road as far south as the southerly line of Range Road prolonged; said land to be, by the said street railway company, or its successors and assigns, permanently used as the location for a street railway: *Provided*, That when it shall cease to be used for this purpose, it shall revert to the United States: *Provided further*, That there shall be reserved to the United States rights of way across said strip of land at the northeasterly and northwesterly corners of the reservation, and at Range Road.

Provisos.
Reversion.

Rights of way reserved.

Amount to be paid.

SEC. 2. That the deed required by the foregoing section of this Act shall not be delivered to the said Nahant and Lynn Street Railway Company until said company shall have paid to the United States, for the said strip of land, the sum of three thousand five hundred dollars.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 10274.]

[Public, No. 493.]

CHAP. 253.—An Act To authorize construction of the Broadway Bridge across the Willamette River at Portland, Oregon.

Willamette River.
Portland, Oreg., may bridge at Broadway.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the city of Portland, in the county of Multnomah, State of Oregon, is hereby fully authorized and empowered to construct and build a bridge to be known as the Broadway Bridge, with appropriate approaches and terminals with a clearance of not less than sixty-five feet above high-water mark and not less than ninety-three and thirteen one-hundredths feet above low-water mark, city datum, across the Willamette, a navigable river, in said city, substantially as follows, to wit: From Broadway Street at or near its intersection with Larrabee Street on the east side of said river, and following the line of Broadway Street extended westerly in its present course to a point at or near its intersection with Seventh Street on the west side of said river; thence southerly and easterly to a point at or near the intersection of Sixth and Irving Streets in said city: *Provided*, That said bridge shall be constructed and maintained in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Proviso.
Construction, etc.
Vol. 34, p. 84.

Retroactive consent.

SEC. 2. For all purposes the consent of Congress, granted by this Act, shall be held as relating back to the commencement of the project, and everything done in connection therewith.

Amendment.

SEC. 3. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 10638.]
[Public, No. 496.]

CHAP. 256.—An Act To authorize the Secretary of War to sell certain lands owned by the United States and situated on Dauphin Island, in Mobile County, Alabama.

Dauphin Island, Ala.
Sale of Government lands on.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War be, and he is hereby, authorized to sell so much or such parts of that certain tract of land condemned and held by the United States, and situated on Dauphin Island, in Mobile County, Alabama, as may not be reasonably necessary for present or prospective military or cognate purposes, for such consideration or upon such terms as he may find reasonable, not less than the original cost, and to execute deeds therefor.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 10823.]
[Public, No. 498.]

CHAP. 258.—An Act To extend the time for the completion of a bridge across the Missouri River at Yankton, South Dakota, by the Yankton, Norfolk and Southern Railway Company.

Missouri River.
Time extended for bridging by Yankton, Norfolk & Southern Ry. Co.
Vol. 33, pp. 62, 621.
Vol. 34, pp. 9, 1058.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section six of the Act approved March ninth, nineteen hundred and four, authorizing the Yankton, Norfolk and Southern Railway Company to construct a combined railroad, wagon, and foot-passenger bridge across the Missouri River at or near the city of Yankton, South Dakota, as amended by the Act approved March twenty-sixth, nineteen hundred and ten, be, and

Vol. 35, pp. 85, 1059.
Public laws, 2d sess., p. 267.

the same is hereby, so amended that the time within which the said bridge is required to be commenced shall be within one year and the time within which it is required that the said bridge shall be completed shall be within three years from the date of the approval of this Act.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 10863.]
[Public, No. 499.]

CHAP. 259.—An Act To give the consent of Congress to the building of a bridge by the city of Northport, Washington, over the Columbia River at Northport.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress be, and is hereby, given to the city of Northport, in the State of Washington, to construct and maintain a wagon bridge and approaches thereto over the Columbia River at a point suitable to the interests of navigation at Northport, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Columbia River.
Northport, Wash., may bridge.
Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 10878.]
[Public, No. 500.]

CHAP. 260.—An Act To authorize the Canyon Snake River Wagon Bridge Commission to construct a bridge across the Snake River at or near the town of Payette, Idaho.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Canyon Snake River Wagon Bridge Commission is hereby authorized to construct, maintain, and operate a bridge and approaches thereto across the Snake River, at a point suitable to the interests of navigation, at or near the town of Payette, in the county of Canyon, in the State of Idaho, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Snake River, Idaho.
Canyon Snake River Wagon Bridge Commission may bridge at Payette.
Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 7549.]
[Public, No. 502.]

CHAP. 262.—An Act Providing for the erection of a joint monument to the memory of General James Screven and General Daniel Stewart, two distinguished officers of the American Army.

Gen. James Screven and Gen. Daniel Stewart.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That a joint monument be erected in the old cemetery at Midway, Liberty County, Georgia, in memory of the lives and public services of General James Screven and General Daniel Stewart.

Monument at Midway, Ga., to.

Appropriation.

SEC. 2. That for the purpose of the construction, erection, and completion of said monument the sum of ten thousand dollars, or so much thereof as is necessary, is hereby authorized, out of any money in the Treasury not otherwise appropriated, to be expended under the direction of the Secretary of War; and the design may be made by the Midway Society, charged as it is with the preservation and care of the said cemetery: *Provided*, That said design shall be approved by the Secretary of War.

Design.

Proviso. Approval.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 9137.]
[Public, No. 503.]

CHAP. 263.—An Act To authorize the expenditure of the sum of twenty-five thousand dollars as a part contribution toward the erection of a monument at Germantown, Pennsylvania, in commemoration of the founding of the first permanent German settlement in America.

Germantown, Pa.

Expenditure for monument to first German settlement.

Provisos. Additional amount required.

Approval of design.

Expenditures.

Care, etc.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the expenditure of the sum of twenty-five thousand dollars is hereby authorized to aid in erecting a monument at Germantown, Pennsylvania, in commemoration of the founding of the first permanent German settlement in America: *Provided*, That no part of the sum herein authorized shall be expended until there shall have been raised and made available for the erection of said monument an additional sum of at least twenty-five thousand dollars: *Provided further*, That the design of said monument shall be approved by the Secretary of War, the governor of the State of Pennsylvania, and the president of the National German-American Alliance; and the money for the erection of the said monument shall be expended under the supervision of the Secretary of War, the governor of Pennsylvania, and the president of the National German-American Alliance: *And provided further*, That the responsibility for the care and keeping of the said monument shall be and remain with the city of Philadelphia, Pennsylvania, it being understood that the United States shall have no responsibility therefor.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 24256.]
[Public, No. 506.]

CHAP. 266.—An Act To authorize commissions to issue in the cases of officers retired or advanced on the retired list with increased rank.

Commissions.

Retired Army, Navy, and Marine Corps officers to receive, for increased rank.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That commissioned officers of the Army, Navy, and Marine Corps on the retired list whose rank has been or shall hereafter be advanced by operation of or in

accordance with law shall be entitled to and shall receive commissions in accordance with such advanced rank.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 25503.]
[Public, No. 510.]

CHAP. 270.—An Act To provide punishment for the falsification of accounts and the making of false reports by persons in the employ of the United States.

Government employees.
Punishment for making false entries in records, etc.
Aiding, etc.
Punishment for making false report of public or trust moneys.
Aiding, etc.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That whoever, being an officer, clerk, agent, or other person holding any office or employment under the Government of the United States and, being charged with the duty of keeping accounts or records of any kind, shall, with intent to deceive, mislead, injure, or defraud the United States or any person, make in any such account or record any false or fictitious entry or record of any matter relating to or connected with his duties, or whoever with like intent shall aid or abet any such officer, clerk, agent, or other person in so doing; or whoever, being an officer, clerk, agent, or other person holding any office or employment under the Government of the United States and, being charged with the duty of receiving, holding, or paying over moneys or securities to, for, or on behalf of the United States, or of receiving or holding in trust for any person any moneys or securities, shall, with like intent, make a false report of such moneys or securities, or whoever with like intent shall aid or abet any such officer, clerk, agent, or other person in so doing, shall be fined not more than five thousand dollars, or imprisoned not more than ten years, or both.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 31652.]
[Public, No. 515.]

CHAP. 257.—An Act To authorize the Central Vermont Railway Company to construct a bridge across the arm of Lake Champlain between the towns of Alburg and Swanton, Vermont.

Lake Champlain.
Central Vermont Ry. Co. may bridge Missisquoi Bay, Alburg to Swanton, Vt.
Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Central Vermont Railway Company, a corporation organized under the laws of the State of Vermont, is hereby authorized to construct, maintain, and operate a bridge and approaches thereto across Missisquoi Bay, an arm of Lake Champlain, at a point suitable to the interests of navigation, between the towns of Alburg and Swanton, in the State of Vermont, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 4, 1911.

CHAP. 277.—An Act To extend the time for commencing and completing the construction of a dam authorized by the act entitled "An act permitting the building of a dam across the Mississippi River in the county of Morrison, State of Minnesota," approved June fourth, nineteen hundred and six.

Mar. 4, 1911.
[H. R. 32721.]
[Public, No. 517.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for commencing and completing the construction of the dam, canal, and other structures authorized by the Act of Congress approved June fourth, nineteen hundred and six, and its amendatory Act approved March second, nineteen hundred and seven, to be built across the Mississippi River, in Morrison County, Minnesota, is hereby extended one year and three years, respectively, from July first, nineteen hundred and eleven: *Provided*, That except as may be otherwise provided in the aforesaid Acts, the construction, maintenance, and operation of the said structures therein authorized shall be subject to, and in accordance with, the provisions of the Act approved June twenty-third, nineteen hundred and ten, entitled "An Act to amend an Act entitled 'An Act to regulate the construction of dams across navigable waters,' approved June twenty-first, nineteen hundred and six."

Mississippi River.
Time extended for dam across, in Morrison County, Minn., by Pike Rapids Power Co.
Vol. 34, p. 210, 1220.
Vol. 34, p. 386.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, March 4, 1911.

CHAP. 278.—An Act To extend the time for the completion of a bridge across the Morris and Cummings Channel, at a point near Aransas Pass, Texas, by the Aransas Harbor Terminal Railway Company.

Mar. 4, 1911.
[H. R. 32883.]
[Public No. 518.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the time for completing the construction of the bridge, authority for which was given the Aransas Harbor Terminal Railway Company, a corporation organized under Texas law, to construct, maintain, and operate a railroad bridge and approaches thereto across the Morris and Cummings Channel, at a point near Aransas Pass, Texas, from the mainland to Harbor Island, authorized by an Act approved May twentieth, nineteen hundred and eight, is hereby extended one year from date of the passage of this Act.

Morris and Cummings Channel.
Time extended for bridging, by Aransas Harbor Terminal Ry. Co.
Vol. 35, p. 168.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment

Approved, March 4, 1911.

CHAP. 281.—An Act To authorize the Controller Railway and Navigation Company to construct two bridges across the Bering River, in the District of Alaska, and for other purposes.

Mar. 4, 1911.
[H. R. 32842.]
[Public, No. 521.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Controller Railway and Navigation Com-

Alaska.

Controller Ry. & Navigation Co. may construct two bridges across Bering River.

Location.

Extension of line.

Wharves, etc. Vol. 30, p. 1151.

pany, a corporation organized and existing under the laws of the State of New Jersey, its successors and assigns, be, and they are hereby, authorized and empowered to construct, maintain, and operate, in accordance with the provisions of the act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six, two bridges across the Bering River, in the District of Alaska, to be located as follows: The upper bridge to cross the said Bering River at a point near the mouth of Stillwater Creek, and the lower bridge to cross the Bering River at a point about four miles above Bering Lake; also to extend its line of railway from the terminus of its line on the north shore of Controller Bay, as shown on its map of definite location filed in the Land Department December fourteenth, nineteen hundred and ten, on and over the tide lands and navigable waters of Alaska in said Controller Bay to the main channel, and to construct, build, erect, maintain, use, and operate at the end of such line of railway, when so extended upon said main channel, under rules and regulations to be prescribed by the Secretary of War, necessary wharves, docks, slips, waterways, and coal and oil bunkers, provided that the extent of and the plans for such structures are recommended by the Chief of Engineers and approved by the Secretary of War, in accordance with the provisions of section ten of the river and harbor Act approved March third, eighteen hundred and ninety-nine.

Right of way over tide and shore lands.

Proviso. Conditions.

Regulations, charges, etc.

SEC. 2. That the said Controller Railway and Navigation Company, its successors and assigns, are hereby authorized to use, in the construction and maintenance of said extension of said line of railway, a right of way on, through, and over the tide and shore lands of the United States actually necessary to connect its railway with the navigable waters in said Controller Bay, not to exceed one hundred feet on each side of the center line of such extension of said line of railway: *Provided*, That the easement hereby authorized may be exclusively exercised so long as said railway is maintained and operated for railroad purposes, but that nothing in this Act contained shall be construed as impairing the right of the United States, or of any State that may hereafter be erected out of this District, to regulate the use of said right of way and the pier or dock herein authorized to be constructed, nor the right of the United States or of any such State to fix reasonable charges for the use of any pier, dock, or wharf constructed or maintained hereunder, nor shall it in anywise interfere with the authority on the part of the Secretary of the Interior to accord wharfage and other privileges in front of reserved areas, as provided in the Act of May fourteenth, eighteen hundred and ninety-eight, entitled "An Act extending the homestead laws and providing for right of way for railroads in Alaska, and for other purposes." Vol. 30, p. 409.

Title not transferred.

SEC. 3. That the title to all lands occupied under this act shall remain in the United States, subject to the use hereby authorized, and the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 32213.]
[Public, No. 523.]

CHAP. 283.—An Act To authorize the city of Portsmouth, New Hampshire, to construct a bridge across the Piscataqua River.

Piscataqua River. Portsmouth, N. H., may bridge.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That authority is hereby given the city of Portsmouth, New Hampshire, or its assigns, a corporation organized under the laws of the State of New Hampshire, to construct, maintain, and operate a bridge and approaches thereto across the Piscataqua River at a point suitable to the interests of navigation, at or near Portsmouth, in the county of Rockingham, in the State of New Hampshire, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six. Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 31728.]
[Public, No. 524.]

CHAP. 284.—An Act To authorize the Manhattan City and Interurban Railway Company to construct and operate an electric railway line on the Fort Riley Military Reservation, and for other purposes.

Fort Riley, Kans. Manhattan City & Interurban Ry. Co. granted right of way across reservation. Approval, etc.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of the United States is hereby given to the Manhattan City and Interurban Railway Company, a corporation existing under the laws of the State of Kansas, to locate, construct, maintain, and operate a line of electric railway upon the military reservation of Fort Riley, in Geary County, State of Kansas, upon such location and under such regulations and conditions as shall be approved by the Secretary of War.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby specially reserved.

Approved, March 4, 1911.

Mar. 4, 1911.
[H. R. 32909.]
[Public, No. 525.]

CHAP. 285.—An Act Making appropriations for sundry civil expenses of the Government for the fiscal year ending June thirtieth, nineteen hundred and twelve, and for other purposes.

Sundry civil expenses appropriations.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums be, and the same are hereby, appropriated, for the objects hereinafter expressed, for the fiscal year ending June thirtieth, nineteen hundred and twelve, namely:

* * * * *

War Department.

UNDER THE WAR DEPARTMENT.

* * * * *

UNDER ENGINEER DEPARTMENT.

Yellowstone.

YELLOWSTONE NATIONAL PARK: For maintenance and repair of improvements, including two thousand five hundred dollars for maintenance of roads leading out of the park from the east and south boundaries and such amount as may be necessary to extend the road to properly connect with the new Canyon Hotel, seventy thousand dollars, to be expended by and under the direction of the Secretary of War and to be immediately available: *Provided*, That no portion of this appropriation shall be expended for the removal of snow from any of the roads for the purpose of opening them in advance of the time when they will be cleared by seasonal changes.

Valley Forge, Pa.
Erection of memorial arch.
Vol. 36, p. 822.

MEMORIAL ARCH AT VALLEY FORGE, PENNSYLVANIA: Erection of a memorial arch at Valley Forge, Pennsylvania, authorized by the Act approved June twenty-fifth, nineteen hundred and ten, entitled "An Act providing for the erection of a memorial arch at Valley Forge, Pennsylvania," to be immediately available and remain available until expended: *Provided*, That the money herein appropriated shall be expended under the direction of the Secretary of War and by such officer as may be designated by him, one hundred thousand dollars.

Proviso.
Direction of expenditures.

Guilford Courthouse, N. C.
Erection of battle-field monument.
Ante, p. 3057.

MONUMENT AT GUILFORD COURTHOUSE, NORTH CAROLINA: For erection of a monument to commemorate the Battle of Guilford Courthouse, North Carolina, authorized by the Act approved February thirteenth, nineteen hundred and eleven, to be immediately available and remain available until expended, and be expended under the direction of the Secretary of War and by such officer as may be designated by him, thirty thousand dollars.

Buildings, and grounds, District of Columbia.

BUILDINGS AND GROUNDS IN AND AROUND WASHINGTON: For improvement and care of public grounds, District of Columbia, as follows:

Improvement and care.

For improvement and maintenance of grounds south of Executive Mansion, four thousand dollars.

For ordinary care of greenhouses and nursery, two thousand dollars.

For repair and reconstruction of the greenhouses at the nursery, three thousand dollars.

For ordinary care of Lafayette Park, two thousand dollars.

For ordinary care of Franklin Park, one thousand five hundred dollars.

For improvement and ordinary care of Lincoln Park, two thousand dollars.

Monument grounds.

For care and improvement of Monument grounds and annex, seven thousand dollars.

For improvement, care, and maintenance of Garfield Park, two thousand five hundred dollars.

For construction and repair of post-and-chain fences, repair of high iron fences, constructing stone coping about reservations, painting watchmen's lodges, iron fences, vases, lamps, and lamp-posts; repairing and extending water pipes, and purchase of apparatus for cleaning them; hose; manure, and hauling the same; removing snow and ice; purchase and repair of seats and tools; trees, tree and plant stakes, labels, lime, whitewashing, and stock for nursery, flower pots, twine, baskets, wire, splints, moss, and lycopodium, to be purchased by contract or otherwise, as the Secretary of War may determine; care, construction, and repair of fountains; abating nuisances; cleaning statues, and repairing pedestals, eighteen thousand five hundred and fifty dollars.

For improvement, care, and maintenance of various reservations, including purchase, maintenance, and driving of horse and vehicle for official use of the officer in charge of public buildings and grounds, and of other necessary vehicles, for official use, thirty thousand dollars.

For improvement, care, and maintenance of Smithsonian grounds, three thousand dollars.

For completion of improvement between Decatur and S Streets northwest on Twenty-second Street, three thousand dollars.

For improvement and maintenance of Judiciary Park, two thousand five hundred dollars.

For grading, soiling, seeding, and planting that portion of Judiciary Park about the Court of Appeals Building and for cement walks, two thousand five hundred dollars.

For laying cement and other walks in various reservations, two thousand dollars.

For broken-stone road covering for parks, three thousand five hundred dollars.

For curbing, coping, and flagging for park roads and walks, two thousand dollars.

Potomac Park.

For care and maintenance of Potomac Park, fifteen thousand dollars.

For grading, soiling, seeding, and planting that portion of Potomac Park west of the railroad embankment, twenty-five thousand dollars.

For constructing a park lodge in Potomac Park, five thousand dollars.

For oiling or otherwise treating macadam roads, four thousand dollars.

Half from District revenues.

One half of the foregoing sums under "Buildings and grounds in and around Washington" shall be paid from the revenues of the District of Columbia and the other half from the Treasury of the United States.

Limit for concrete, etc., pavements.

Under appropriations herein contained no contract shall be made for making or repairing concrete or asphalt pavements in Washington City at a higher price than one dollar and eighty-five cents per square yard for a quality equal to the best laid in the District of Columbia prior to July first, eighteen hundred and eighty-six, and with a base of not less than six inches in thickness.

For improvement, care, and maintenance of grounds of executive departments, one thousand dollars.

For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Library of Congress as may be requested by the superintendent of the Library building, one thousand dollars.

For such trees, shrubs, plants, fertilizers, and skilled labor for the grounds of the Capitol, the Senate and House Office Buildings, as may be requested by the superintendent of the Capitol building, four thousand dollars.

Executive Mansion grounds.

For improvement and maintenance of Executive Mansion grounds (within iron fence), five thousand dollars.

For the employment of an engineer by the officer in charge of public buildings and grounds, two thousand four hundred dollars.

For purchase and repair of machinery and tools for shops at nursery, and for the repair of shops and storehouse, one thousand dollars.

Botanical Gardens.

Removing fence, etc.

For removing fence and wall around the Botanical Gardens and such grading, soiling, seeding, and sodding as may be incident thereto, two thousand five hundred dollars.

Stable for Executive Office.

Removal.

For removal of the stable of the Executive Office and for such grading, soiling, seeding, and sodding as may be incident thereto, to be immediately available, one thousand dollars, or so much thereof as may be necessary.

Accommodation of horses, etc., by Quartermaster General.

The Quartermaster General of the Army shall provide suitable accomodations for the horses, carriages, and other vehicles of the President and of the Executive Office, in the stables maintained in the District of Columbia by and for the use of his department.

Executive Mansion.

Care, etc.

EXECUTIVE MANSION: For ordinary care, repair, and refurnishing of Executive Mansion, and for purchase, maintenance, and driving of horses and vehicles for official purposes, to be expended by contract or otherwise, as the President may determine, thirty-five thousand dollars.

For fuel for the Executive Mansion, greenhouses, and stable, six thousand dollars.

For care and maintenance of greenhouses, Executive Mansion, nine thousand dollars.

For repairs to greenhouses, Executive Mansion, three thousand dollars.

Traveling expenses of the President.

For traveling expenses of the President of the United States, to be expended in his discretion and accounted for on his certificate solely, twenty-five thousand dollars.

Lighting Executive Mansion, etc.

For lighting the Executive Mansion, the grounds, the greenhouses, and the stables, including all necessary expenses of installation, maintenance, and repair, eight thousand six hundred dollars, or so much thereof as may be necessary.

Lighting and heating public grounds.

LIGHTING AND HEATING FOR THE PUBLIC GROUNDS: For lighting the public grounds, watchmen's lodges, offices, stable, and greenhouses at the propagating gardens, including all necessary expenses of installation, maintenance, and repair, fifteen thousand eight hundred dollars;

For heating offices, office stable, watchmen's lodges, and greenhouses at the propagating gardens, three thousand eight hundred and twenty dollars;

Half from District revenues.

In all, nineteen thousand six hundred and twenty dollars, or so much thereof as may be necessary, one half of which sum shall be paid from the revenues of the District of Columbia and the other half from the Treasury of the United States.

Payment for lighting limited.

Hereafter no greater sum shall be paid any company for lighting any gas or electric lamp in the public grounds, or for installing or moving the same, than is paid by the District of Columbia for similar services, and no contract shall be required to be entered into for lighting the public grounds. Any settlement for arc lighting under the existing contract with the Potomac Electric Power Company effected by the Commissioners of the District of Columbia shall apply to the contract with the same company for arc lights for the public grounds and highway bridge.

Settlement of contract.

Statue of John Paul Jones.

Expenses of unveiling.

UNVEILING STATUE OF JOHN PAUL JONES: For unveiling and dedicating the statue of John Paul Jones and for each and every purpose connected therewith, including erecting and taking down reviewing stands and putting the grounds in sightly condition, to be available until expended, two thousand five hundred dollars.

Government telegraph.

TELEGRAPH TO CONNECT THE CAPITOL WITH THE DEPARTMENTS AND GOVERNMENT PRINTING OFFICE: For care and repair of existing lines, five hundred dollars.

Washington Monument.

Maintenance.

WASHINGTON MONUMENT: For the care and maintenance of the Washington Monument, namely: For one custodian, at one hundred dollars per month; one steam engineer, at eighty dollars per month; one assistant steam engineer, at seventy dollars per month; one fireman, at fifty-five dollars per month; one assistant fireman, at fifty-five dollars per month; one conductor of elevator car, at seventy-five dollars per month; one attendant on floor, at sixty dollars per month; one attendant on top floor, at sixty dollars per month; three night and day watchmen, at sixty dollars per month each; in all, eight thousand eight hundred and twenty dollars.

Expenses.

For fuel, lights, oil, waste, packing, tools, matches, paints, brushes, brooms, lanterns, rope, nails, screws, lead, electric lights, heating apparatus, oil stoves for elevator car and upper and lower floors; repairs to engines, boilers, dynamos, elevator, and repairs of all kinds connected with the Monument and machinery; and purchase of all necessary articles for keeping the Monument, machinery, elevator, and electric plant in good order, three thousand dollars.

Building where Abraham Lincoln died.

REPAIRS OF BUILDING WHERE ABRAHAM LINCOLN DIED: For painting and miscellaneous repairs, two hundred dollars.

Wakefield, Va.

IMPROVEMENTS, WAKEFIELD, VIRGINIA: For repairs to fences and cleaning up and maintaining grounds about the monument, one hundred dollars.

Commission of Fine Arts.
Vol. 36, p. 371.

COMMISSION OF FINE ARTS: To meet the expenses made necessary by the Act approved May seventeenth, nineteen hundred and ten, entitled "An Act establishing a Commission of Fine Arts," the purchase of periodicals, maps, and books of reference, and necessary office furniture and fixtures, to be disbursed on vouchers approved by the commission, by the officer in charge of public buildings and grounds, who shall be the secretary and shall act as the executive officer of said commission, eight thousand eight hundred dollars.

Rivers and harbors, contract work.

RIVERS AND HARBORS, CONTRACT WORK: Toward the construction of works on harbors and rivers, under contract and otherwise, and within the limits authorized by law, namely:

Vol. 30, p. 1121.

For works authorized by the river and harbor Act of eighteen hundred and ninety-nine, as follows:

Bay Ridge and Red Hook Channels, New York.

Improving channel in Gowanus Bay, New York: For continuing improvement of Bay Ridge and Red Hook Channels, in completion of contract authorization, two hundred and forty-one thousand dollars.

San Francisco, Cal.

Improving harbor at San Francisco, California: For continuing improvement by the removal of Centissima and Rincon Reef rocks, thirty thousand dollars.

Vol. 32, p. 331.

For works authorized by the river and harbor Act of nineteen hundred and two, as follows:

Arthur Kill, N. Y. and N. J.

Improving Arthur Kill, New York and New Jersey: For continuing improvement of channel from Kill van Kull to Raritan Bay, in completion of contract authorization, sixty-one thousand dollars.

For works authorized by the river and harbor Act of nineteen hundred and seven, as follows: Vol. 34, p. 1073.

Improving harbor at Boston, Massachusetts: For continuing improvement of thirty-five foot channel, nine hundred thousand dollars. Boston, Mass.

Improving Cold Spring Inlet, New Jersey: For continuing improvement with a view to securing a depth of twenty-five feet, one hundred and thirty thousand dollars. Cold Spring Inlet, N. J.

Improving harbor at Cleveland, Ohio: For continuing improvement in accordance with plan for new harbor entrance and breakwater extension, two hundred thousand dollars. Cleveland, Ohio.

Improving Detroit River, Michigan: For continuing improvement of Livingstone Channel in accordance with plan "B," east route, one hundred and fifty thousand dollars. Detroit River, Mich.

Improving harbor at Ludington, Michigan: For continuing improvement, in completion of contract authorization, two hundred and nineteen thousand and eighty-seven dollars. Ludington, Mich.

Improving Ohio River: For continuing construction of Lock and Dam Numbered Twenty-six, in completion of contract authorization, one hundred and fifty-five thousand dollars. Ohio River. Lock and Dam No. 26.

Improving Passaic River, New Jersey; For continuing improvement of channel in Newark Bay and Passaic River, sixty thousand dollars. Passaic River, N. J.

Improving Saint Marys River, Michigan: For continuing improvement at the falls by the construction of a new lock, with a separate canal, five hundred thousand dollars. St. Marys River, Mich. New canal, etc.

Improving harbor at San Luis Obispo, California: For continuing improvement in completion of contract authorization, sixty-four thousand dollars. San Luis Obispo, Cal.

For works authorized by the river and harbor act of nineteen hundred and ten, as follows: Vol. 36, p. 630.

Improving Arthur Kill, New York and New Jersey: For continuing improvement of channel north of Shooters Island, ninety thousand dollars. Arthur Kill, N. Y. and N. J.

Improving harbor at Ashtabula, Ohio: For continuing improvement in completion of contract authorization, three hundred and seventy-six thousand four hundred and thirty dollars. Ashtabula, Ohio.

Improving Black Warrior, Warrior, and Tombigbee Rivers, Alabama: For continuing improvement by the construction of locks and dams in completion of contract authorization, two hundred and fifty thousand dollars. Black Warrior, Warrior, and Tombigbee Rivers, Ala.

Improving Cape Fear River, North Carolina: For continuing improvement by the construction of locks and dams above Wilmington, two hundred thousand dollars. Cape Fear River, N. C.

Improving Cumberland River below Nashville, Tennessee: For continuing improvement by the construction of locks and dams, two hundred and fifty thousand dollars. Cumberland River below Nashville, Tenn.

Delaware River, Pa. and N. J.
Philadelphia to Trenton.

Improving Delaware River, Pennsylvania and New Jersey: For continuing improvement by excavating a channel twelve feet deep from Allegheny Avenue, Philadelphia, Pennsylvania, to Trenton, New Jersey, one hundred and sixty thousand dollars.

Fairport, Ohio.

Improving harbor at Fairport, Ohio: For completing improvement, one hundred and five thousand dollars.

Kentucky River, Ky.

Improving Kentucky River, Kentucky: For continuing improvement by the construction of Locks and Dams Numbered Thirteen and Fourteen, in completion of contract authorization, sixty-five thousand dollars.

Newport, R. I.

Improving harbor at Newport, Rhode Island: For completing improvement, one hundred and eighty-three thousand dollars.

Ohio River.
Application to specified locks and dams.

Improving Ohio River below Pittsburg, Pennsylvania: For continuing improvement by the construction of Locks and Dams Numbered Seven, Nine, Ten, Twelve, Nineteen, Twenty, Twenty-nine, Forty-one, and Forty-eight, one million seven hundred and ten thousand dollars.

Providence River and Harbor, R. I.

Improving Providence River and Harbor, Rhode Island: For continuing improvement between Kettle Point and Gaspee Point and on the western side of the harbor at and above Fields Point, three hundred thousand dollars.

Puget Sound-Lake Washington Waterway.

Puget Sound-Lake Washington Waterway: For continuing improvement by the construction of a double lock, with the necessary accessory works, one hundred and fifty thousand dollars.

Saginaw, River, Mich.

Improving Saginaw River, Michigan: For continuing improvement, three hundred thousand dollars.

Saint Andrews Bay, Fla.

Improving Saint Andrews Bay, Florida: For completing improvement, one hundred and twenty-eight thousand five hundred and sixty dollars.

Siuslaw River, Oreg.

Improving Siuslaw River, Oregon: For continuing improvement by jetty construction at the mouth, fifty thousand dollars.

Maps.

MAPS, WAR DEPARTMENT: For publication of engineer maps for use of the War Department, inclusive of war maps, five thousand dollars.

Survey of northern and northwestern lakes.

SURVEY OF NORTHERN AND NORTHWESTERN LAKES: For survey of northern and northwestern lakes, including all necessary expenses for preparing, correcting, extending, printing, and issuing charts and bulletins, and of investigating lake levels, with a view to their regulation, to be immediately available, one hundred and twenty-five thousand dollars: *Provided*, That the survey of said northern and northwestern lakes be extended so as to include the lakes and other natural navigable waters embraced in the navigation system of the "New York Canals."

Proviso.
Extension.

California Débris Commission.
Vol. 27, p. 507.

CALIFORNIA DÉBRIS COMMISSION: For defraying the expenses of the commission in carrying on the work authorized by the Act of Congress approved March first, eighteen hundred and ninety-three, fifteen thousand dollars.

HARBOR OF NEW YORK: For prevention of obstructive and injurious deposits within the harbor and adjacent waters of New York City:

New York Harbor. Deposits.

For pay of inspectors, deputy inspectors, office force, and expenses of office, ten thousand two hundred and sixty dollars;

Inspectors.

For pay of crews and maintenance of patrol fleet, six steam tugs, and one launch, seventy-five thousand dollars;

Crews, etc.

In all, eighty-five thousand two hundred and sixty dollars.

INTERNATIONAL WATERWAYS COMMISSION: For continuing the work of investigation and report by the International Waterways Commission, authorized by section four of the river and harbor Act aproved June thirteenth, nineteen hundred and two, twenty thousand dollars.

International Waterways Commission.
Vol. 32, p. 373.

WRECK OF BATTLESHIP MAINE: For additional amount for the raising or the removal of the wreck of the battleship Maine from the harbor of Habana, in accordance with the provisions of the Act approved May ninth, nineteen hundred and ten, three hundred and fifty thousand dollars, or so much thereof as may be necessary.

Battleship "Maine."
Removing wreck from Habana Harbor.
Vol. 36, pp. 353, 789.

*   *   *   *   *

UNDER THE DEPARTMENT OF THE INTERIOR.

Interior Department.

*   *   *   *   *

MISCELLANEOUS OBJECTS, DEPARTMENT OF THE INTERIOR.

Miscellaneous.

*   *   *   *   *

So much of the appropriation of twelve thousand dollars, made in the sundry civil Act approved June twenty-fifth, nineteen hundred and ten, to enable the Secretary of the Interior to examine into the data required to be submitted by the city of San Francisco with reference to a water supply for that city from Lake Eleanor and adjacent watersheds partially within the Yosemite Park or from any other available sources of water supply, and to collect such independent data and information as may be necessary in the premises, including all incidental expenses of the officers of the Engineer Corps of the United States Army detailed by the Secretary of War as an advisory board to the Secretary of the Interior in connection therewith, as remains unexpended on the thirtieth day of June, nineteen hundred and eleven, is hereby reappropriated and made available during the fiscal year nineteen hundred and twelve to enable the Secretary of the Interior to continue such work during that period.

Yosemite Park.
Examination of San Francisco water supply.
Balance available.
Vol. 36, p. 745.

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Fortifications.

FORTIFICATIONS, ISTHMIAN CANAL.

Seacoast batteries, Canal Zone.

For construction of seacoast batteries on the Canal Zone, two million dollars.

Seacoast cannon, etc.

For the purchase, manufacture, and test of seacoast cannon for coast defense, including their carriages, sights, implements, equipments, and the machinery necessary for the manufacture at the arsenals, to cost ultimately not to exceed one million nine hundred and sixty-six thousand dollars, one million dollars, the same to be immediately available and to continue available until expended.

* * * * *

Sums for salaries to be in full.

SEC. 7. That all sums appropriated by this act for salaries of officers and employees of the Government shall be in full for such salaries for the fiscal year nineteen hundred and twelve, and all laws or parts of laws in conflict with the provisions of this Act be, and the same are hereby, repealed.

Approved, March 4, 1911.

Mar. 4, 1911.
[S. 10536.]
[Private, No. 260.]

CHAP. 292.—An Act Directing the Secretary of War to convey the outstanding legal title of the United States to lot numbered twenty, square numbered two hundred and fifty-three, in the city of Washington, District of Columbia.

District of Columbia.
Title of United States to lot 20, square 253, released.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War is hereby directed to grant to the present occupants of lot numbered twenty, square numbered two hundred and fifty-three, a quitclaim deed of the legal title of the United States to the said lot, it having appeared that the United States has no interest therein or claim thereto other than a record title arising from a failure to comply with the requirements of the Act of the Maryland Legislature of December nineteenth, seventeen hundred and ninety-one, relative to the recording of deeds in the original city of Washington: *Provided,* That the occupants of said lot shall establish to the satisfaction of the Secretary of War their title to the said premises, saving only the aforesaid outstanding legal title of the United States.

Proviso.
Proof of title.

Approved, March 4, 1911.

May 11, 1911.
[H. J. Res. 38.]
[Pub. Res. No. 3.]

[No. 3.] Joint Resolution To grant authority to the American Red Cross to erect temporary structures in Potomac Park, Washington, District of Columbia.

American Red Cross.
May erect temporary structures in Potomac Park, D. C.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That authority be, and is hereby, given to the Chief of Engineers, United States Army, to grant permission, under such conditions and restrictions as he may deem necessary, to the executive committee of the American Red

Cross to erect for exhibition purposes at the meeting of the International Red Cross in nineteen hundred and twelve temporary structures in Potomac Park or other public ground in the city of Washington, on a site to be approved by the Chief of Engineers: *Provided*, That the United States shall be put to no extra expense of any kind thereby and that the structures shall be promptly removed by the American Red Cross at the close of the meeting, and the site cleared of all débris and put in as good condition as before the erection of the structures.

Proviso. No expense, etc.

Approved, May 11, 1911.

CHAP 1.—An Act To authorize the extension and widening of Colorado Avenue northwest from Longfellow Street to Sixteenth Street, and of Kennedy Street northwest through lot numbered eight hundred, square numbered twenty-seven hundred and eighteen.

June 30, 1911.
[H. R. 8649.]
[Public, No. 1.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That under and in accordance with the provisions of subchapter one, of chapter fifteen, of the Code of Law for the District of Columbia, within six months after the passage of this Act, the Commissioners of the District of Columbia be, and they are hereby, authorized and directed to institute in the Supreme Court of the District of Columbia a proceeding in rem to condemn the land that may be necessary for the extension and widening of Colorado Avenue northwest from Longfellow Street to Sixteenth Street with a width of one hundred and twenty feet, according to the plan for the permanent system of highways for the District of Columbia, and of Kennedy Street northwest through lot numbered eight hundred, square twenty-seven hundred and eighteen, with a width of ninety feet: *Provided, however*, That the entire amount found to be due and awarded by the jury in said proceeding as damages for, and in respect of, the land to be condemned for said extension and widening, plus the costs and expenses of the proceeding hereunder, shall be assessed by the jury as benefits.

District of Columbia. Colorado Avenue and Kennedy Street. Condemning land for extending, etc. Vol. 34, p. 151.

Proviso. Damages assessed as benefits.

SEC. 2. That there is hereby appropriated, out of the revenues of the District of Columbia, an amount sufficient to pay the necessary costs and expenses of the condemnation proceedings herein provided for and for the payment of the amounts awarded by the jury as damages, to be repaid to the District of Columbia from the assessments for benefits and covered into the Treasury to the credit of the revenues of the District of Columbia.

Appropriation for expenses, etc.

Payment of awards.

Approved, June 30, 1911.

August 10, 1911.
[S. 1149.]
[Public, No. 6.]

CHAP 6.—An Act Permitting the Minneapolis, Saint Paul and Sault Sainte Marie Railway Company to construct, maintain, and operate a railroad bridge across the Saint Croix River between the States of Wisconsin and Minnesota.

Saint Croix River.
Minneapolis, Saint Paul and Sault Sainte Marie Railway Company may bridge, between Burnett County, Wis., and Pine County, Minn.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to the Minneapolis, Saint Paul and Sault Sainte Marie Railway Company, a railway corporation organized under the laws of the States of Wisconsin and Minnesota, to construct, maintain, and operate a railroad bridge and approaches thereto, across the Saint Croix River, at a point suitable to the interests of navigation, from a point on the south bank of said river in lot one, section twenty-one, township forty-one north, range sixteen west, in Burnett County, Wisconsin, to a point on the north bank of said river in lot one, section twenty-one, township forty-one north, range sixteen west, in Pine County, Minnesota, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 10, 1911.

August 10, 1911.
[S. 2732.]
[Public, No. 7.]

CHAP. 7.—An Act To authorize the Providence, Warren and Bristol Railroad Company and its lessee, the New York, New Haven and Hartford Railroad Company, or either of them, to construct a bridge across the Palmers or Warren River, in the State of Rhode Island.

Palmers or Warren River.
Providence, Warren and Bristol Railroad Company et al., may bridge, Bristol County, R. I.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Providence, Warren and Bristol Railroad Company and its lessee, the New York, New Haven and Hartford Railroad Company, or either of them, are hereby authorized to construct, maintain, and operate a bridge, with approaches thereto, across the Palmers or Warren River at a point suitable to the interests of navigation, at or near the point of their existing bridge across said river, in the county of Bristol, in the State of Rhode Island, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 10, 1911.

August 10, 1911.
[S. 2768.]
[Public, No. 8.]

CHAP 8.—An Act To authorize the Saint Louis-Kansas City Electric Railway Company to construct a bridge across the Missouri River at or near the town of Weldon Springs Landing, Missouri.

Missouri River.
Saint Louis-Kansas City Electric Railway Company may bridge, at Weldon Springs Landing, Mo.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Saint Louis-Kansas City Electric Railway Company, a corporation organized under the laws of the State of Missouri, is hereby authorized to construct, maintain, and operate a bridge and approaches across the Missouri River at a point suitable to the interests of navigation, at or near the town of Weldon Springs Landing, in the State of Missouri, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 10, 1911.

August 14, 1911.
[H. J. Res. 1.]
[Pub. Res., No. 5.]

[No. 5.] Joint Resolution To amend certain appropriation Acts approved March fourth, nineteen hundred and eleven.

Appropriation Acts for 1912, amended.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the sundry civil appropriation Act approved March fourth, nineteen hundred and eleven, is amended as follows:

* * * * *

Mount Rainier Park.
Amount reduced.
Vol. 36, p. 1421.

The appropriation made in said Act for protection and improvement of Mount Rainier National Park, Washington, is reduced from five thousand four hundred dollars to five thousand dollars.

* * * * *

Approved, August 14, 1911.

August 14, 1911.
[H. R. 7693.]
[Public, No. 9.]

CHAP. 9.—An Act To authorize the town of Logan, Aitkin County, Minnesota, to construct a bridge across the Mississippi River in Aitkin County, Minnesota.

Mississippi River.
Logan, Minn., may bridge, near Palisade.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the town of Logan, a municipal corporation organized under the laws of the State of Minnesota, is hereby authorized to construct, maintain, and operate a bridge, and approaches thereto, across the Mississippi River, at a point suitable to the interests of navigation, at or near the section line between sections twenty-three and twenty-four and about one-half mile above Palisade, in the county of Aitkin, in the State of Minnesota, in accordance with the provisions of the Act entitled "An Act

Vol. 34, p. 84.

to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 14, 1911.

August 14, 1911.
[H. R. 11022.]
[Public, No. 10.]

CHAP. 10.—An Act To authorize the bridge directors of the Jefferson County bridge district to construct a bridge across the Arkansas River at Pine Bluff, Arkansas.

Arkansas River.
Jefferson County, Ark., may bridge, at Pine Bluff.
Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the board of directors of the Jefferson County bridge district be, and they are hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Arkansas River, at a point suitable to the interests of navigation, at or near the city of Pine Bluff, in the county of Jefferson and State of Arkansas, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Former act repealed.
Vol. 34, p. 50.

SEC. 3. That the Act entitled "An Act to authorize the construction of a bridge across the Arkansas River at Pine Bluff, Arkansas," approved March fifth, nineteen hundred and six is hereby repealed.

Approved, August 14, 1911.

August 15, 1911.
[S. 2766.]
[Public, No. 13.]

CHAP. 13.—An Act To authorize the Saint Louis, Iron Mountain and Southern Railway Company to construct and operate a bridge across the Saint Francis River in the State of Arkansas, and for other purposes.

Saint Francis River.
Saint Louis, Iron Mountain and Southern Railway Company may bridge, in Lee County, Ark.
Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Saint Louis, Iron Mountain and Southern Railway Company, a corporation created and existing under and by virtue of the laws of the States of Missouri and Arkansas, is hereby authorized to construct, maintain, and operate a bridge across and over the Saint Francis River in the State of Arkansas, at such point in section twenty-five, township three north, range four east in Lee County, in said State, suitable to the interests of navigation, as may hereafter be selected by said company for crossing said river with its railway line, in accordance with the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 15, 1911.

August 16, 1911.
[S. 144.]
[Public, No. 14.]

CHAP. 14.—An Act To legalize a bridge across the Pend Oreille River, in Stevens County, Washington.

Pend Oreille River, Idaho and Washington Northern Railway Company's bridge in Stevens County, Wash., legalized.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to the Idaho and Washington Northern Railway Company, a corporation of the State of Idaho, its successors and assigns, to maintain and operate a bridge and approaches thereto now constructed across the Pend Oreille River, at or near where said river flows through Box Canyon in Stevens County, in the State of Washington, such maintenance and operation to be subject to, and in accordance with, the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six: *Provided*, That in the judgment of the Chief of Engineers and the Secretary of War the bridge as built provides suitable and proper facilities for present and prospective navigation, and is in all respects satisfactory to navigation interests; and if, in their judgment, any changes in said bridge are necessary to meet the aforesaid conditions, such changes shall be immediately made by the said company at its own expense: *Provided further*, That drawings showing the plans and location of the said bridge as built shall be filed in the War Department within thirty days of the approval of this Act.

Provisos.
Approval of Secretary of War, etc.

Plans, etc.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 16, 1911.

August 16, 1911.
[S. 850.]
[Public, No. 15.]

CHAP. 15.—An Act To amend an Act entitled "An Act to legalize and establish a pontoon railway bridge across the Mississippi River at Prairie du Chien, and to authorize the construction of a similar bridge at or near Clinton, Iowa," approved June sixth, eighteen hundred and seventy-four.

Mississippi River.
Rebuilding, etc., bridge, at Prarie du Chien, Wis., authorized.
Vol. 18, p. 62, amended.
Vol. 34, p. 615.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act approved June sixth, eighteen hundred and seventy-four, legalizing and declaring a lawful structure the pontoon railway bridge across the Mississippi River at Prairie du Chien, Wisconsin, be, and is hereby, so amended as to permit its rebuilding and relocation, with pontoon draw openings, in the two channels of

Proviso. Construction. Vol. 34, p. 84. said river of shorter length: *Provided*, That the bridge shall be rebuilt in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable streams," approved March twenty-third, nineteen hundred and six.

Amendment. Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 16, 1911.

August 16, 1911. [S. 1627.] [Public, No. 16.]

CHAP. 16.—An Act To authorize the construction, maintenance, and operation of a bridge across and over the Arkansas River, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Muskogee and Fort Gibson Bridge Company, a corporation of the State of Oklahoma, its successors and assigns, are hereby authorized to construct, maintain, and operate a bridge and approaches thereto across and over the Arkansas River, at a point suitable to the interests of navigation, at or near the city of Muskogee, Muskogee County, Oklahoma, in accordance with and subject to the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Arkansas River. Muskogee and Fort Gibson Bridge Co. may bridge, Muskogee, Okla. Vol. 34, p. 84.

Amendment. Sec. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 16, 1911.

August 16, 1911. [S. 2878.] [Public, No. 17.]

CHAP. 17.—An Act To authorize the Chicago, Lake Shore and Eastern Railway Company to construct a bridge across the Calumet River, in the State of Indiana.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Chicago, Lake Shore and Eastern Railway Company, a corporation organized under the laws of the States of Indiana and Illinois, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a railroad bridge and approaches thereto across the Calumet River, at a point suitable to the interests of navigation, in the northeast quarter of section three, township thirty-six north, range eight west of the second principal meridian, in Lake County, in the State of Indiana, in accordance with the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Calumet River. Chicago, Lake Shore & Eastern Ry. Co. may bridge, in Lake County, Ind. Location. Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 16, 1911.

August 16, 1911.
[H. R. 6098.]
[Public, No. 18.]

CHAP. 18.—An Act To authorize the Campbell Lumber Company to construct a bridge across the Saint Francis River from a point in Dunklin County, Missouri, to a point in Clay County, Arkansas.

St. Francis River.
Campbell Lumber Co. may bridge, between Dunklin County, Mo., and Clay County, Ark.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Campbell Lumber Company, a corporation organized under the laws of the State of Missouri, its successors and assigns, be, and it is hereby, authorized to construct, maintain, and operate a bridge, and approaches thereto, across the Saint Francis River at a point suitable to the interests of navigation, from a point in Dunklin County, Missouri, near range line between ranges eight and nine, in township eighteen, to a point in section six, township nineteen, range nine, in Clay County, Arkansas, in accordance with the provisions of an Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is expressly reserved.

Approved, August 16, 1911.

August 16, 1911.
[H. R. 11021.]
[Public, No. 19.]

CHAP. 19.—An Act To authorize the Levitte Land and Lumber Company to construct a bridge across Bayou Bartholomew, in Drew County, Arkansas.

Bayou Bartholomew.
Levitte Land & Lumber Co may bridge, in Drew County Ark.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Levitte Land and Lumber Company, a corporation organized and doing business under the laws of the State of Arkansas, and its assigns, be, and they are hereby authorized to construct, maintain, and operate a bridge and approaches thereto, across Bayou Bartholomew at a point suitable to the interests of navigation, at or near a point in the southwest quarter of the southwest quarter of section thirty-six, township thirteen south, range four west, in the county of Drew, in the State of Arkansas, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 16, 1911.

August 16, 1911.
[H. R. 11477.]

[Public, No. 20.]

CHAP. 20.—An Act Authorizing the construction of a bridge, and approaches thereto, across the Tug Fork of the Big Sandy River at or near Matewan Station, in Mingo County, West Virginia.

Tug Fork of Big Sandy River.

Blackberry, Kentucky, and West Virginia Coal & Coke Co. may bridge, Matewan, W. Va.

Vol. 34, p. 84.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Blackberry, Kentucky, and West Virginia Coal and Coke Company, a corporation organized under the laws of the State of West Virginia, its successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a bridge, and approaches thereto, across Tug Fork of the Big Sandy River at a point suitable to the interests of navigation at or near the point where Blackberry Creek empties into the said river, and within one mile and a half of the station of Matewan, Mingo County, West Virginia, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 16, 1911.

August 17, 1911.
[H. R. 6747.]

[Public, No. 24.]

CHAP. 24.—An Act To reenact an Act authorizing the construction of a bridge across Saint Croix River, and to extend the time for commencing and completing the said structure.

Saint Croix River.

Time extended for bridging, by Wisconsin Central Railway Company.

Vol. 36, p. 285.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act entitled "An Act permitting the Wisconsin Central Railway Company to construct, maintain, and operate a railroad bridge across the Saint Croix River between the States of Wisconsin and Minnesota," approved March twelfth, nineteen hundred and ten, is hereby revived; and the time for commencing and completing the bridge therein authorized is hereby extended one year and three years, respectively, from the date of approval hereof.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 17, 1911.

August 19, 1911.
[H. R. 4682.]

[Public, No. 28.]

CHAP. 29.—An Act Authorizing the construction of a bridge, and approaches thereto, across the Tug Fork of the Big Sandy River at or near Glenhayes Station, in Wayne County, West Virginia.

Tug Fork, Big Sandy River.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Glenhayes Company, a corporation organized under the laws of the State of West Virginia, its successors and assigns, be, and are hereby, authorized to construct, maintain, and operate a bridge, and approaches thereto, across the Tug Fork of the Big Sandy River, at a point suitable to the interests of navigation, at or near Glenhayes, in Wayne County, West Virginia, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Glenhayes Company may bridge, at Glenhayes, W. Va.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, August 19, 1911.

CHAP. 30.—An Act To construct a bridge across Rock River at or near Colona Ferry, in the State of Illinois.

August 19, 1911.
[H. R. 8146.]
[Public, No. 29.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the counties of Henry and Rock Island, in the State of Illinois, be, and they are hereby, authorized to construct, maintain, and operate a bridge and approaches thereto across the Rock River, at a point suitable to the interests of navigation, at or near Colona Ferry, in the State of Illinois, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Rock River. Henry and Rock Island Counties may bridge, at Colona Ferry, Ill.

Vol. 34, p. 84.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Amendment.

Approved, August 19, 1911.

CHAP. 31.—An Act Permitting the building of a railroad bridge across the Saint Croix River between Burnett County, Wisconsin, and Pine County, Minnesota.

August 19, 1911.
[H. R. 11723.]
[Public, No. 30.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby granted to the Twin City and Lake Superior Railway Company, a railway corporation organized under the laws of the State of Wisconsin, its successors and assigns, to build a railroad bridge across the Saint Croix River from a point suitable to the interests of navigation on the south bank of said river in the vicinity of the section line between sections five and six, township forty north, range seventeen west, Burnett County, Wisconsin, to a point on the north bank of said river in the vicinity of the section line between sections five and six, township forty north, range seventeen west, in Pine County, Minnesota, in accordance with the provisions of the Act entitled "An Act to regu-

Saint Croix River. Twin City and Lake Superior Railway Company may bridge, between Burnett County, Wis., and Pine County, Minn.

Vol. 34, p. 84.

late the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 19, 1911.

August 19, 1911.
[S. 306.]
[Public, No. 33.]

CHAP. 34.—An Act To confirm the name of Commodore Barney Circle for the circle located at the eastern end of Pennsylvania Avenue southeast, in the District of Columbia.

District of Columbia.
Commodore Barney Circle designated.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That from and after the passage of this Act the circle located at the eastern end of Pennsylvania Avenue southeast, in the District of Columbia, now known as public reservations numbered fifty-five and fifty-six, shall be officially known and designated "Commodore Barney Circle."

Approved, August 19, 1911.

August 21, 1911.
[S. 3253.]
[Public, No. 34.]

CHAP. 35.—An Act To authorize the counties of Yell and Conway to construct a bridge across the Petit Jean River.

Petit Jean River.
Yell and Conway Counties, Ark., may bridge, at Pontoon.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the counties of Yell and Conway, bodies corporate under the laws of the State of Arkansas, their successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a steel drawbridge and approaches thereto across the Petit Jean River, a navigable stream, at or near Pontoon, Arkansas, along the Yell and Conway County lines, in the State of Arkansas, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable streams," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 21, 1911.

August 22, 1911.
[H. R. 7263.]
[Public, No. 36.]

CHAP. 37.—An Act To authorize the counties of Bradley and McMinn, Tennessee, by authority of their county courts, to construct a bridge across the Hiwassee River at Charleston and Calhoun, in said counties.

Hiwassee River.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the counties of Bradley and McMinn, Tennes-

Bradley and McMinn Counties, Tenn., may bridge, Charleston to Calhoun.

see, by authority of their county courts, be, and they are hereby, authorized to construct, maintain, and operate a free bridge, and approaches thereto, across the Hiwassee River, at a point suitable to the interests of navigation from the town of Charleston, in Bradley County, to the town of Calhoun, immediately across the Hiwassee River, in McMinn County, in the State of Tennessee, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 22, 1911.

August 22, 1911.
[H. R. 7690.]
[Public, No. 37.]

CHAP. 38.—An Act To authorize the construction of a bridge across the Snake River at the town of Nyssa, Oregon.

Snake River. Malheur County and Nyssa, Oreg., may bridge.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the county commissioners of Malheur County, State of Oregon, and the town of Nyssa, Malheur County, Oregon, their successors and assigns, be, and they are hereby, authorized to construct, maintain, and operate a wagon and foot bridge, and approaches thereto, across the Snake River, at a point suitable to the interests of navigation, at the town of Nyssa, Oregon, in accordance with the provisions of the Act entitled "An Act to regulate the construction of bridges over navigable waters," approved March twenty-third, nineteen hundred and six.

Vol. 34, p. 84.

Amendment.

SEC. 2. That the right to alter, amend, or repeal this Act is hereby expressly reserved.

Approved, August 22, 1911.

August 22, 1911.
[S. 943.]
[Public, No. 40.]

CHAP. 41.—An Act To improve navigation on Black Warrior River, in the State of Alabama.

Black Warrior River, Ala. Change authorized in plans for Lock and Dam 17.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of War is hereby authorized, in his discretion, to change the detailed plans and specifications for the construction of Lock and Dam Seventeen, on the Black Warrior River, Alabama, so as to increase the height of the pool level over the dam crest of Lock Seventeen to a height of sixty-three feet above the pool level of Lock Sixteen, so as to render unnecessary the building of Locks Eighteen and Nineteen, as now authorized, and so as to provide for the extension of slack water up the Mulberry and Locust Forks of the Black Warrior

River to Sanders Shoals and Nichols Shoals, respectively, and for the development of water power.

Detailed plans, etc., to be prepared. Suspension of work.

SEC. 2. That the Secretary of War is hereby authorized and directed to have prepared such detailed plans and estimates as may be necessary to carry into effect the purposes of this Act, and he is further authorized in his discretion to suspend operations during his investigations and to enter into supplemental agreements with the present contractors for Lock and Dam Seventeen, providing for the annulment of existing contracts or for their modification so as to cover the work required for the construction of the higher lock and dam, as he may deem most advantageous for the interests of the United States.

Use of appriations if changes advisable. Vol. 35, pp. 359, 998. Vol. 36, pp. 646, 729, 742, 1406.

SEC. 3. Should the construction of the higher dam at site seventeen be found advisable the appropriations and authorizations heretofore made for the cost of locks and dams on the Black Warrior, Warrior, and Tombigbee Rivers, Alabama, shall be available for the construction of Dam Seventeen and such locks as may be necessary to overcome the lift between the pools created by Dams Sixteen and Seventeen.

Approved, August 22, 1911.

August 22, 1911. [S. J. Res. 3.]

[Pub. Res. No. 9.]

[No. 9.] Joint Resolution Extending the operation of the Act for the control and regulation of the waters of Niagara River, for the preservation of Niagara Falls, and for other purposes.

Niagara Falls, preservation of. Provisions of Act for, extended. Vol. 34, p. 626. Vol. 35, p. 1169.

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of an Act entitled "An Act for the control of the waters of Niagara River, for the preservation of Niagara Falls, and for other purposes," be, and they are hereby, extended and reenacted from June twenty-ninth, nineteen hundred and eleven, being the date of the expiration of the operation of said Act, to March first, nineteen hundred and twelve.

Approved, August 22, 1911.

APPENDIX M M M.

ANNUAL REPORT OF THE MISSISSIPPI RIVER COMMISSION FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

OFFICE MISSISSIPPI RIVER COMMISSION,
St. Louis, Mo., June 30, 1911.

SIR: The Mississippi River Commission has the honor to submit this its annual report for the year ending June 30, 1911.

The act of June 28, 1879, by which the commission was created, defined its duties as follows:

> To direct and complete such surveys of said river, between the Head of the Passes near its mouth to its headwaters as may now be in progress, and to make such additional surveys, examinations, and investigations, topographical, hydrographical, and hydrometrical, of said river and its tributaries as may be deemed necessary by said commission to carry out the objects of this act. * * * To take into consideration and mature such plan or plans and estimates as will correct, permanently locate, and deepen the channel and protect the banks of the Mississippi River; improve and give safety and ease to the navigation thereof; prevent destructive floods; promote and facilitate commerce, trade, and the postal service; * * *

Under the authority of this act and subsequent laws relating to the subject, surveys and observations have been carried on and works of improvement under the authority and direction of laws making appropriations for that purpose have been undertaken and executed. The original project contained in the report of the Mississippi River Commission dated February 17, 1880, contemplated the permanent fixing and improvement of the channel to a depth of at least 10 feet at extreme low water by the contraction of the low-water width to about 3,000 feet, the protection of the banks against caving, and the control of the flood waters by means of levees. This report was the one upon which Congress made its first appropriation for the river improvement under commission plans, thereby officially adopting such plans for the inauguration of work. The works designed primarily for the rectification and improvement of the channel have been confined to the Plum Point Reach, 147 to 186 miles, and Lake Providence Reach, 517 to 552 miles below Cairo. These reaches were selected because here the shifting sand bars and deficient depths were the most pronounced and the low-water navigation was the most difficult. Highly beneficial results were obtained in the improvement of the channel depths in those reaches, and the work done in them confirmed the soundness of the theory upon which it was based, but also demonstrated that the permanent improvement of the channel by contraction and revetment works would necessarily consume a long period of time, while the pressing needs of commerce called for immediate relief. Fortunately, the development in hydraulic dredging machinery had reached such a stage as to hold out the hope that an immediate and economical solution of the problem of temporarily deepening the channel for navigation purposes might be found in the opening and maintenance of channels across the obstructing bars at each low-water season by means of dredging. After studies and experiments extending over several years this method of temporary improvement of the low-water channel was adopted with a view to maintaining a navigable channel 250 feet in width and not less than 9 feet in depth and has been applied with success. The history of the work from the beginning, and of the experiences which led to the adoption of this method and the reasons therefor, are fully detailed in former reports.

One of the important items in the operations of the commission is the general repair and construction of levees, which was first authorized without qualifying restrictions by the act of September 19, 1890, and since that date about one-half of the appropriations made by Congress have been devoted to that purpose.

The project under which the work of the commission has been conducted for several years past and which is proposed for the year to come may be stated in general terms as follows:

1. Continuation of surveys; preparation and publication of maps; maintenance of gauges; the recording, tabulation, and publication of gauge readings; the taking and recording of discharge measurements at high and low stages of the Mississippi River and its tributaries; and other observations.
2. The building, extension, and repair of levees.
3. The building, maintenance, and operation of dredge boats.
4. The repair and extension of existing works for the improvement of the channel, the preservation of harbors, the prevention of cut-offs, and the security of levees.
5. The maintenance of a low-water channel between the Mississippi, Red, and Atchafalaya Rivers.
6. Other miscellaneous details incident to the execution of the general project, all of which are treated in the following pages.

APPROPRIATIONS AND ALLOTMENTS.

From the appropriation of $2,000,000 carried in the sundry civil act approved May 27, 1908, for continuing improvement of the Mississippi River from Head of the Passes to the mouth of the Ohio River, a reserve balance of $1,000 was, on recommendation of the Mississippi River Commission, allotted to dredges and dredging.

By the river and harbor act approved June 25, 1910, the sum of $2,000,000 was appropriated for continuing improvement of the Mississippi River from Head of the Passes to the mouth of the Ohio River, including salaries, clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission. One million nine hundred and seventy-seven thousand dollars of the amount thus appropriated was allotted on recommendation of the Mississippi River Commission, as shown on page 2920 of the Report of the Chief of Engineers for 1910.

Of the remaining $23,000 of this appropriation, on recommendation of the Mississippi River Commission, $10,000 was allotted to revetment work at Reid-Bedford Bend and $13,000 to dredges and dredging.

By the river and harbor act approved February 27, 1911, the sum of $3,000,000 was appropriated for continuing improvement of the Mississippi River from Head of the Passes to the mouth of the Ohio River, including salaries, clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission. Two million nine hundred and eighty-eight thousand dollars of the amount thus appropriated was allotted on recommendation of the Mississippi River Commission as follows:

GENERAL.		
Mississippi River Commission	$30,000	
Surveys, gauges, and observations	66,000	
Dredges and dredging	365,000	
		$461,000
FIRST AND SECOND DISTRICTS.		
Surveys	5,000	
Upper St. Francis levee district	25,000	
Lower St. Francis levee district	50,000	
White River levee district	60,000	
For bank revetment at Sunflower, Miss., for protection of levee and the improvement of the channel	140,000	
For bank revetment at Porter Lake, Ark., for protection of levee and the improvement of the channel	105,000	
For bank revetment at Golden Lake, Ark., for protection of levee and the improvement of the channel	105,000	
General repairs and stone	100,000	
Care and repairs to plant	65,000	
New plant	222,000	
		877,000
THIRD DISTRICT.		
Surveys	5,000	
Lower Yazoo levee district	60,000	
Upper Tensas levee district	100,000	
For bank revetment at Lake Bolivar, Miss., for protection of levee and the improvement of the channel	70,000	
For bank revetment at Vaucluse, Ark., for protection of levee and the improvement of the channel	35,000	
For bank revetment at Grand Lake, Ark., for protection of levee and the improvement of the channel	140,000	
For bank revetment at Reid-Bedford, La., for protection of levee and the improvement of the channel	35,000	
For bank revetment at Ashbrook Neck, Miss., for prevention of cut-off and the improvement of the channel	35,000	
For bank revetment at Leland Neck, Ark., for prevention of cut-off and the improvement of the channel	35,000	
General repairs and stone	85,000	
Repairs and maintenance of plant	50,000	
New plant	190,000	
		840,000
FOURTH DISTRICT.		
Surveys	5,000	
Lower Tensas levee district	50,000	
Barataria levee district	12,000	
Lake Borgne levee district	13,000	
For bank revetment at Kempe Bend, La., for protection of levee and the improvement of the channel	275,000	
For bank revetment, Natchez and Vidalia Harbors, for preservation of existing works	75,000	
For bank revetment at Plaquemine, La., for protection of levee and the improvement of the channel	50,000	
New Orleans Harbor	200,000	
General repairs and stone	25,000	
Plant	100,000	
		805,000
For expenditure at discretion of the president, Mississippi River Commission		5,000
Unallotted balance		12,000
		3,000,000

The following reallotments of funds have been made during the year:

From allotment for dredges and dredging to surveys, gauges, and observations	$13,000
From allotment for New Orleans Harbor to plant, fourth district	8,000

In addition to the above appropriations $9,600 was allotted by the Chief of Engineers for the fiscal year ending June 30, 1911, from the permanent indefinite appropriation made by act of August 11, 1888, as amended by act of June 13, 1902, for gauging the waters of the Mississippi River and its tributaries, which is applied to the maintenance of certain river gauges.

Details of the expenditures of the various allotments are appended hereto.

MISSISSIPPI RIVER COMMISSION.

On July 1, 1910, Col. W. L. Fisk, Corps of Engineers, United States Army, became member and president of the commission, succeeding Gen. Wm. H. Bixby, who had become Chief of Engineers, United States Army.

On March 10, 1911, Col. Fisk was relieved as member of the commission by Col. C. McD. Townsend, Corps of Engineers, United States Army. Col. Wm. T. Rossell, Corps of Engineers, United States Army, has been acting president since March 10, 1911.

No other change has occurred in the membership of the commission during the year.

The following changes have occurred in the personnel of officers in charge of works under the commission:

Lieut. Col. Chas. L. Potter, Corps of Engineers, United States Army, relieved First Lieut. C. H. Knight, Corps of Engineers, United States Army, of his duties as secretary of the commission on December 14, 1910.

Capt. Clarke S. Smith, Corps of Engineers, United States Army, has been in charge of the first and second districts since September 20, 1910, on which date he relieved Maj. M. L. Walker, Corps of Engineers, United States Army, of his duties in those districts.

Capt. Clarke S. Smith was in charge of the third district until March 24, 1911, when he was relieved of his duties in that district by Capt. James A. Woodruff, Corps of Engineers, United States Army.

Maj. H. Burgess, Corps of Engineers, United States Army, has been in charge of the fourth district from July 1 to 15 and from December 15, 1910, to date. Capt. Robert R. Ralston, Corps of Engineers, United States Army, was temporarily in charge of this district from July 15 to December 15, 1910.

Three sessions of the commission were held during the year, the one hundred and thirteenth and the one hundred and fourteenth on board the steamer *Mississippi* during the low-water inspection of the river November 14 to 23, 1910, and during the high-water inspection April 12 to 21, 1911, respectively; the one hundred and fifteenth at the offices of the commission in St. Louis, Mo., June 21 and 22, 1911.

At all of these sessions public hearings were given to representatives of the navigation, commercial, and other interests of the river.

SURVEYS, GAGES, AND OBSERVATIONS.

Surveys.—The field work of the general survey of the Mississippi River from Head of the Passes to the headwaters was completed in July, 1904, and the reduction and platting of all the field notes have been completed. The extent and character of the general survey is given in the annual reports of the commission for previous years.

The cross sections of the Mississippi River from Cairo to the mouth of the Arkansas River derived from the low-water survey of 1902–1904, and from the surveys of 1877–1884, mentioned in last year's report, have been completed. The various cross-section elements have been measured and tabulated for comparison and study.

The subject is one of great interest, and since it has been determined to make a general resurvey of the river below Cairo, to begin this coming season, which will incidentally include further data for comparison of cross sections, it seems advisable to defer the final discussion until such data are available.

Owing to the discrepancy of about 1 foot found to exist in the earlier line of precise levels from the Gulf to Fort Adams, Miss., in 1900, as stated in previous annual reports, the rerunning of the precise levels northward has been continued from time to time until 1909, when the work reached Memphis.

During the season of 1910 a party was put in the field and carried the releveling from Cairo, Ill., to Memphis, Tenn., where connection was made with the work of 1909.

This releveling now extends from the jetties to Cairo, Ill., a distance by river of about 1,070 miles, not including the side line of 87 miles from Biloxi to New Orleans. The reduction of the field notes of this last stretch—Memphis to Cairo—is now in progress in the secretary's office; when this reduction is completed the elevations of all the survey marks and gauges can be referred to the adopted mean Gulf level at Biloxi, Miss.

The river and harbor act approved June 25, 1910, charges the commission with "making an examination and report upon the necessity, urgency, and practicability of permanently separating the waters of the Red and Atchafalaya Rivers from those of the Mississippi River, together with an estimate of the cost of such work." In conformity with this requirement the following has been done: In the examination relative to permanently separating the waters of the Red and Atchafalaya Rivers from those of the Mississippi River detailed surveys were made during the last low-water season of the Atchafalaya River from Barbre Landing to Simmesport, of Old River between the Mississippi and Atchafalaya Rivers, and of the Mississippi River in the vicinity of mouth of Old River.

Borings were made in Old River near the foot of Turnbull Island, and a reconnoissance was made along the Red, Ouachita, and Tensas Rivers to determine approximately the limits of overflow in the Lower Tensas Basin due to flood waters of the Mississippi River. The field notes of these surveys and examinations are being reduced and maps and cross sections prepared for comparison with previous surveys.

A detailed survey was also made of the Mississippi River above and below Union Point and of the area, in part, on the right bank to the Red River to determine the practicability of constructing a canal between the Red and Mississippi Rivers in that vicinity.

Discharge observations have also been made in connection with these examinations on the Mississippi River above and below mouth of Old River, on Old River, and on the Atchafalaya, Red, and Black Rivers during the recent high water.

Maps.—Charts Nos. 252 to 261 have been published during the year, extending this series, scale 1:10000, from near Leech Lake River to upper end of Lake Winnibigoshish, Minn., about 1,297 miles above Cairo. Charts Nos. 262 to 268 of this series, drawn to a scale of 1:5000, are nearly ready for the publisher, and charts Nos. 270, 274, and 278 are in various stages of completion.

Map No. 146, scale inch to mile, has been completed ready for the publisher, and map No. 147 is about one-half complete. There still remain three more sheets to complete this series to Lake Itasca, and these have been outlined by pantograph.

Gauges.—The regular gauges, high-water gauges, and tide gauges have been maintained during the year, periodic inspections being made for the purpose of making needed repairs to gauges and bulletins and testing the gauges.

During the low-water season of 1910 the Mississippi River did not reach a very low stage and no low-water slope observations were made except at the regular gauge stations, which are about 50 miles apart. During the high-water season of 1911 the Mississippi River reached a moderately high stage in April, and the highest readings were recorded at all the high-water and regular gauges from Cairo to the Head of the Passes. The results are given in Table No. 2 of the secretary's report. Table No. 7 of the same report also gives the highest gauge readings at all stations on the Mississippi River and its tributaries during the year to June 30, 1911.

DISCHARGE OBSERVATIONS.

During the low-water season of 1910 the discharge of the Mississippi River at Carrollton, La., was measured. This was the only low-water discharge measured during 1910.

The high-water discharge of the Mississippi River was measured at Columbus, Ky., Chicot, Ark., and Carrollton, La., and also above and below the mouth of Old River in connection with the Red River closure survey; the high-water discharge of Old, Atchafalaya, Red, and Black Rivers was also measured in connection with this survey. The results of all discharge observations are being reduced and tabulated.

For further details concerning the foregoing, attention is invited to the report of Lieut. Col. Chas. L. Potter, Corps of Engineers, United States Army, secretary, appended hereto.

DREDGES AND DREDGING.

Project.—A statement of the project under which the hydraulic dredges of the commission have been built, maintained, and operated will be found on page 8 of the annual report for 1904. Nine dredges are now available for operation under this project. Experimental changes have been continued on the dredge *Gamma* with a view to increasing the output of the dredges.

Plans and specifications are being prepared for a new inspection boat for use in connection with dredging operations. These are for a modified design, as the bids received for the boat as designed last year exceeded the amount allotted.

Plans and specifications have also been prepared for two additional small steamboats for surveys in connection with dredging operations.

The success attained in dredging and the importance of unfailing maintenance of the channel is discussed in the reports of 1905 and subsequent years, and the recommendations made therein for ample funds to carry on this work continuously as required is again renewed.

Season's operations.—The low-water season of 1910 began comparatively early, the Cairo gauge reading 8.2 feet on August 22. This was the lowest stage for August since 1901. Moderate rises occurred in September and October, and these were followed by a continuously low stage lasting until the end of December. This continuous low stage was very favorable to the maintenance of good depths, since fluctuating stages increase the difficulties of maintaining a channel. The lowest reading on the Cairo gauge during the season was 5.12 feet on November 14. During the season of 1910 the stage was below 10 feet on the Cairo gauge for 73 days, as compared with 36 days during the previous season.

Owing to the low stage and the number of troublesome bars, which extended over 566 miles of river, the present inspection boat and small survey boats were quite inadequate to obtain the necessary information far enough in advance to get the dredges to the bars in time, and in consequence less than 9 feet in depth prevailed for a few days at some of the crossings preceding the arrival and proper placing of a dredge. It is thought this can be avoided in future when the new inspection boat and two new survey boats now contemplated are available for use.

At seven bars less than the project depth of 9 feet was found. The least controlling depth at any of these was at Medleys, 31 miles below Cairo, where, at the end of October, a few days before the arrival of the dredge *Harrod*, a map of survey showed a least depth of 7½ feet; by November 5 this dredge had increased the depth to 11½ feet over this crossing. At five of these seven crossings 8 feet was found, namely: Point Pleasant, 80 miles below Cairo; New Haven, 163 miles; Walts, 201 miles; Daisy, 252 miles; and at Catfish, 422 miles below Cairo; at Ashton, 519 miles below Cairo, 8.2 feet was found. These unfavorable conditions prevailed, however, for only a few days.

With the above exceptions there was not less than 9 feet of navigable water through all controlling bars below Cairo throughout the season. Seven dredges, the *Gamma*, *Epsilon*, *Zeta*, *Iota*, *Kappa*, *Henry Flad*, and *B. M. Harrod* were in commission during the season, and dredging was done by them at 20 bars from Medleys, 31 miles below Cairo, to Youngs Point, 597 miles below Cairo.

The season's dredging operations began early in August, 1910, and the last dredge was withdrawn from the field and laid up at West Memphis, Ark., by January 2, 1911.

Owing to the unusually low stage of the river at Cairo prevailing toward the end of May, which has extended into the present month, two dredges were sent into the field. One of these began dredging at Point Pleasant Middle Crossing, 81 miles below Cairo, on June 1; the other began dredging at Bullerton Crossing, 167 miles below Cairo, on June 10, and ample depths were secured at each of these places in a few days. Some dredging was also done at Round Lake, 160 miles below Cairo, after work at Bullerton was completed. Not less than 10½ feet was found at any bar so far this season; generally the depths were not less than 12 feet.

The lowest stage at Cairo thus far this season was on June 6, when the Cairo gauge read 11.52 feet. With fluctuations within a small range the stage has remained nearly constant until toward the end of the month a slight rise has set in. The average of the lowest readings, occurring either in May or June each year for the last 10 years before this, is 22.2 feet.

For further details concerning the dredges and dredging, attention is invited to the report of Lieut. Col. Charles L. Potter, Corps of Engineers, United States Army, secretary, appended hereto.

CHANNEL WORK, BANK PROTECTION, AND HARBOR IMPROVEMENTS IN THE SEVERAL DISTRICTS.

First district, from Cape Girardeau, Mo., to the foot of Island 40 (270 miles).—Headquarters: Customhouse, Memphis, Tenn. District officer: Maj. M. L. Walker, Corps of Engineers, United States Army, from beginning of year to September 20, 1910; Capt. Clarke S. Smith, Corps of Engineers, United States Army, since that date.

Construction works for channel improvement, protection of caving banks, and harbor work in this district are located at Columbus and Hickman, Ky., New Madrid, and Caruthersville, Mo., and Plum Point Reach, together with certain isolated works, consisting of low-water channel dikes at different points throughout this district.

Columbus, Ky., 21 miles below Cairo, left bank.—The work at this point was done in 1889 and 1890, and consists of five submerged dikes, protecting about 2,200 feet of harbor front. No repairs have been made since and no work other than possible minor repairs is proposed for the coming season.

Hickman, Ky., 36 miles below Cairo, left bank.—The work at this point consists of 1,450 feet of effective continuous revetment placed in 1889, 1892, and 1894 to prevent caving along the lower portion of the town. Slight repairs were made in 1900 on account of injury to the revetment from local drainage. The work is now in good condition and nothing additional is at present contemplated.

Slough Landing Neck, Tenn., 60 miles below Cairo, left bank.—The river is threatening to make a cut-off at this locality, the width of the neck having now been reduced to 6,300 feet; the maximum caving since last report amounts to about 400 feet on the upstream and 1,000 feet on the downstream side of the neck. Since the points of maximum caving are not both opposite the narrowest part of the neck, the minimum distance across has decreased about 800 feet during the past year.

New Madrid, Mo., 71 miles below Cairo, right bank.—This work consists of bank revetment extending along the river front of the town, of continuous fascine mattresses 260 feet wide below low water, with riprap paving on the graded bank above low water. Nine hundred feet of revetment were constructed in 1893, and afterwards extended, as follows: Seven hundred feet in 1894, 500 in 1896, 1,373 in 1898, and 1,000 in 1900. The present effective revetment is 4,450 feet long and is in good condition. For the present no additional work will be required at this point.

Caruthersville, Mo., 110 miles below Cairo, right bank.—The work at this point consists of one spur dike and a continuous revetment for the protection of the caving bank in font of the town. There is now about 2,400 feet of effective revetment at this point. No work here is contemplated this season.

Plum Point Reach, 147 to 186 miles below Cairo.—The works in this reach comprise about 68,200 feet of revetment for the protection of caving banks, the partial closure of the chutes behind Elmot Bar and Island 30 with a brush and stone dam, the closure of Osceola and Bullerton chutes with pile dikes, and a levee along the left bank to confine the flood waters more nearly to the low-water channel. The object of all these works was to increase the navigable depth at low-water in a reach of river which had been noted for years for its obstructing sand bars. As a result the banks have remained practically fixed within prescribed limits, and the navigable depth at low water has been increased to such an extent that little or no difficulty has been experienced in navigating this reach since the works approached completion. At no time since the works were well under way has navigable depth reached as low a point as it did nearly every low-water season prior to the construction of the rectification work. No work was done here during the past season.

It is not probable that any work other than minor repairs will be undertaken in this reach during the coming season.

Abatis dikes.—These dikes are used for the purpose of closing secondary chutes and for contracting the low-water channels by building up sand bars. No work of this kind was done in the first district during the past and none is contemplated during the coming season.

For further details concerning work in the first district, see report of Capt. Smith, appended hereto.

Second district, foot of Island 40 to White River (173 miles).—Headquarters: Customhouse, Memphis, Tenn. District officer: Maj. M. L. Walker, Corps of Engineers, United States Army, from beginning of year to September 20, 1910; Capt. Clarke S. Smith, Corps of Engineers, United States Army, since that date.

This district includes the protection of caving banks and harbor work at Hopefield Bend, Ark., Memphis, Tenn., and at Porter Lake, Helena, Walnut Bend, and Old Town, Ark., and also the dredging of Wolf River, Tenn.

Hopefield Bend, Ark., 227 miles below Cairo, right bank.—This revetment, originally 16,600 feet long, was constructed at various times between 1882 and 1889, and has been repaired at various times. By 1906 this revetment had been replaced by 14,800 feet of standard revetment, and the paving had been carried to the top of the bank over practically all of this length. The repairs to the revetment, referred to in last report as being necessary, were made during the past working season. An examination of the revetment, made after recession of the spring flood this year, disclosed no breaks, and it is thought that no work will be required during the coming season.

Wolf River, 230 miles below Cairo, left bank.—The part of this stream under improvement is a part of Memphis Harbor and the improvement consists of dredging, for the purpose of maintaining a 5-foot navigable channel during the low-water season, from its mouth 2½ miles upstream to the county bridge. During the past year dredging was done in this stream from its mouth upstream about one-half mile. Dredging will be continued during the coming season, there being a sufficient balance of funds left from the last year's allotment.

Memphis Harbor, 230 to 232 miles below Cairo, left bank.—The work along the Memphis front embraces the protection of 14,800 linear feet of bank by means of spur dikes and continuous revetment, the upper portion of which is covered by a sand bar which encroaches somewhat upon the levee front of the city. The area of this bar between Wolf River and the levee front is about 100 acres at low water, of which 12 acres is above water at the 25-foot stage. The cross sections over the bar show some changes, which have not, however, impaired the effectiveness of the revetment which continues in good condition. No repairs were made during the past season and none are contemplated for the coming season. The present effective length of this work is 9,900 feet.

Walnut Bend, Ark., 281 miles below Cairo, right bank.— During the past few years the bank along this bend had been caving with great rapidity and threatened to cut into the St. Francis River near this point. There are two objections to allowing this cut-off to take place. The first objection is that such a cut-off would materially raise the low-water level of the St. Francis River at this point, thus inundating much land that is normally under cultivation when the Mississippi River is within its banks. The second objection is that such a cut-off would preclude the possibility of extending the lower St. Francis levee downstream across Hardins Point. This extension is a part of the contemplated project of the Lower St. Francis levee board, and would lower the backwater over a very considerable territory behind what is now the lower end of the Lower St. Francis levee system (mile 283 R.). A survey of the St. Francis River showed that a levee system along the left bank of this river to protect against the backwater from the Mississippi would cost considerably more than half a million dollars, and since the bank could be protected for less than one-half of this sum by means of standard revetment the idea of this back levee was abandoned. The efficiency of abatis dikes as bar builders suggested their use at this point to build a bar down into the caving bend and thus stop the caving. (For details of abatis dike construction, see Report of Chief of Engineers, 1899, pp. 3518–19 and pl. 15.) A project was submitted providing for two dikes of a total length of 4,000 feet to be built in the season of 1906 at a cost of $25,000, and two more dikes to be built in the season of 1907, provided that the results obtained from the first two dikes warranted a continuation of this part of the project. In case the two dikes built in 1906 did not build the bar as rapidly as expected there still remained time in the season of 1907 to revet this caving bend. The part of the project for 1906 was carried out and two dikes were built 970 feet apart. The upper dike was 1,454 feet long and the lower dike 1,755 feet long. A very considerable bar has been built up in the neighborhood of these dikes, and the effect of the dikes extends about 1 mile below the lowest dike. During the season of 1907–8, 1,800 feet of bank revetment were placed. The next season effort was made to draw the main river away from the bend by a dredged cut across the bar opposite. This was unsuccessful and an extension of 2,000 linear feet was made to the revetment. During the past working season the revetment was extended downstream about 580 feet and 2,380 feet upstream. No further work is contemplated here the coming season, except possible minor repairs.

Helena, Ark., 306 miles below Cairo, right bank.—The revetment work at this place consists of the protection of 4,900 linear feet of river bank in front of the city, of which 3,500 feet is continuous revetment and 1,400 feet is dike work. There is no change in the bank line along this front and the revetment seems to be generally intact. A small but unimportant fault developed during 1909–10, which it is planned to repair this season.

Old Town, Ark., 324 miles below Cairo, right bank.—The bank in this bend has been caving slowly for a long time and had finally cut in so close to the levee that it was necessary either to protect the bank or to build a new levee along the caving bend. A survey was made to show the cost of such a loop and, owing to a lake immediately in the rear of the present levee, the cost of this loop was large; it was estimated at $370,000. The bank could be held by standard revetment for less than half of this amount, and since this bank protection would not only obviate the necessity for the costly loop but would serve as an improvement to the channel, it was decided to protect the bank. For similar reasons to those set forth in regard to Walnut Bend, it was decided to construct two abatis dikes in the upper part of the bend in the season of 1906, with the hope that they would build a bar down into the bend and protect it from further caving. The conditions of this point were very unfavorable for the use of the abatis dikes, but it was considered justifiable to try them, since the estimate for the abatis dikes was only $18,000 and the estimate for revetting this bend with the standard revetment was about $170,000, and even in case the abatis dikes did not give the desired results, they would still protect the upper end of any revetment that would be put in later. Two abatis dikes were constructed in the upper part of the bend 1,370 feet apart. The upper dike was 900 feet long and the lower one 1,260 feet long, and the total cost was $13,383.19. A survey in March of 1907 showed that although a bar had been built around these dikes, the effect in the bend below was not sufficient to warrant building further dikes in the season of 1907, and the project for the revetment of this bend was submitted and approved. During the season of 1907–8, 3,615 feet of revetment was built at this point and the bank was paved to a suitable height. During the season of 1908–9 the revetment was extended about 1,200 feet downstream and 2,400 feet during the season of 1909–10, and a further downstream extension of 1,700 feet was made during the past season. This revetment is now in good condition and no further work is contemplated here at present.

For further details concerning the work in the second district, see report of Capt. Smith, appended hereto.

Third district: From White River, Ark., to Warrenton, Miss. (214 miles).—Headquarters: Vicksburg, Miss. District officer: Capt. Clarke S. Smith, Corps of Engineers, United States Army, to March 24, 1911, and Capt. James A. Woodruff, Corps of Engineers, since that date.

This district includes the works of improvement on the Mississippi River at Panther Forest, Leland Neck, and Vaucluse, Ark.; Lake Bolivar Front, Ashbrook Neck, Greenville, Longwood, Fitlers Bend, and Albemarle Bend, Miss.; Lake Providence, Louisiana Bend, Delta Point, and Reid-Bedford Bend, La.; at Red Fork, Ark., on Arkansas River, and levee construction in the Lower Yazoo and Upper Tensas levee districts. Operations of the past year included the construction of a new revetment at Albemarle Bend, Miss.; repairs or extensions or both to revetments at Panther Forest, Leland Neck, and Vaucluse, Ark.; Greenville Harbor and Fitlers Bend, Miss.; at Red Fork, on the Arkansas River, and levee work in both districts.

Lake Bolivar Front, 417 miles below Cairo, left bank.—The work at this point consists of revetment, begun in 1888–89, to hold the caving bank and prevent the destruction of a levee across the head of Lake Bolivar, which would have necessitated the building of a long and very expensive loop back of the lake. Repairs have been made from time to time to the upper bank paving, and the mattress has been reenforced where showing signs of weakness. The present effective length of the work is 3,550 feet, all of which is in good condition, except at the lower end, where an eddy is rapidly undermining the revetment. In order to prevent further damage an extension of this revetment downstream will be necessary. No work was done during the year.

Ashbrook Neck, 446 miles below Cairo, left bank.—The work here consists of 10,100 feet of revetment built to prevent a cut-off which would have disturbed the regimen of the river for a long distance above and below and brought disaster to towns, levees, and other works along the river bank. Repairs and extensions have been made from time to time. The present effective length of the revetment is 10,275 feet, which appears to be in good condition. A reenforcing fascine mattress near the head of the work may be necessary, and a downstream extension of about 2,000 feet should be made, as caving continues along the upper side of the neck. At the narrowest point below the revetment the distance between bank lines is now less than 2,500 feet. No work was done during the year.

Panther Forest, Ark., 452 miles below Cairo, right bank.—This revetment is designed to protect an angle in the main levee, at a point where a new loop would have been very expensive. Work was begun in 1908 and consisted of the construction of 2,037 feet of standard revetment. Work the past season consisted of the construction of 2,077 linear feet of standard revetment downstream from the lower end of the previous work. The present effective length of this work is 4,150 feet, which is holding well except at the upper end where some caving occurred. It will probably be necessary to extend this revetment upstream within the next two years to protect the angle of the controlling levee.

Leland Neck, Ark., 470 miles below Cairo, right bank.—This revetment is designed to prevent a cut-off across the narrow neck at this place, the effects of which would be similar to those referred to in connection with the original necessity for work at Ashbrook Neck. Work was begun in 1909, when 3,150 feet of revetment was built. This was extended 1,057 feet downstream the past season. The present effective length is 4,200 feet. An extension of this revetment downstream next season is deemed desirable to afford protection to the spur levee built to prevent flow across the neck at flood stages.

Greenville Harbor, 478 miles below Cairo, left bank.—The town and harbor of Greenville and the levee along its front are protected by a bank revetment having an effective length of 12,500 feet. During the 12 years from 1882 to 1894 the bank at the Greenville bend receded about 4,000 feet. Work here was begun in 1887, when 10 submerged dikes were placed. The plan was changed to continuous revetment in 1891 and since the completion of the work it has been effective in maintaining the bank line. Repairs have been made from time to time, and at present 800 feet of the work is old dike protection repaired with fascine pocket mats, and the balance is fascine mattress. Only minor repairs were made the past season. In the bend above the work caving has been active and now threatens the upper end of the revetment. An upstream extension is deemed desirable the coming season.

Vaucluse, Ark., 487 miles below Cairo, right bank.—This revetment is designed to protect the main levee where it crosses the bed of an old lake and where a new loop would have been very expensive. Work was begun in 1908, when 1,864 linear feet of standard revetment was built. During the past season an extension 1,000 feet was made downstream, making the present effective length of the work about 2,700 feet. It is probable that an upstream extension will be necessary to render complete the protection of the levee crossing Lake Chicot.

Longwood, Miss., 500 miles below Cairo, left bank.—Revetment was placed in the rapidly caving bend here in 1904–5 to prevent the destruction of a large levee, comparative study having shown that a loop around the threatened section would have been much more expensive. The effective length of the revetment is 4,200 feet, which is entirely shielded by the sand bar in front and is secure from attack. No further extension is necessary and no work has been done since 1905.

Lake Providence Reach, 517–552 miles below Cairo, right bank.—This section of the river was selected by the commission soon after its formation for improvement of the low-water channel by means of contraction works and revetment of caving banks. Though marked deepening of shallow crossings resulted, the work was finally discontinued owing to lack of funds and the enactment of a law limiting the use of bank revetment. Most of the structures, which were comparatively weak, have been destroyed, but a much improved low-water channel still exists. In later years active revetment work was resumed at Louisiana Bend and at Lake Providence, but with special objects in view.

Louisiana Bend, 522 miles below Cairo, right bank.—The revetment in this bend is part of the systematic improvement of Lake Providence Reach. Work was begun in 1889 and was continued from time to time as funds were available until 1897. No work has been done since that date. The present effective length is 11,300 feet, more than half of which is covered by a bar at the upper end. No further work or extensions seem to be needed and no work was done.

Lake Providence, La., 540 miles below Cairo, right bank.—The bank revetment here protects the town of Lake Providence and the important levee across the foot of the lake. It has an effective length of about 12,600 feet, 4,700 of which is original fascine mattress, 5,000 feet is fascine mattress reenforced with fascine mattress, 1,700 feet is old type-woven mattress reenforced with fascine mattress, and 1,200 feet is unreenforced old type-woven mattress. No extensions or repairs have been made since 1909; the work remains in good condition; no repairs were needed the last season.

Fitlers Bend, Miss., 550 miles below Cairo, left bank.—This work was provided for by an allotment in 1906, covering construction of revetment to protect the levee from destruction by caving of the bank; otherwise a new levee would soon have been required at such great cost as to be almost impracticable of accomplishment. Work was begun in 1907, when about 2,000 feet of bank was protected by revetment, which was extended about 1,000 feet upstream in 1909–10. The present effective length is 3,200 feet. Active caving at the lower end necessitated the placing of two connecting mats the past season, after which caving took place about 2,000 feet above the upper end of the present revetment. From present indications it would seem desirable to extend this revetment upstream, and await further caving below before adding to the length of the revetment at its lower end.

Albemarle Bend, Miss., 568 miles below Cairo, left bank.—This is a new work, designed to prevent further caving in this bend, where this action has progressed for a great many years, destroying many levees and involving large expenditures for new ones. During the past four years the bank has been eroded at the rate of about 500 feet per year. The approved project contemplated the construction of about 10,000 feet of revetment, and work was begun in August, 1910, using plant and party from the first and second districts, and later from the fourth district, in conjunction with parties and plant of the third district, and during the period August 17, 1910, to March 3, 1911, 11,650 feet of revetment (base-line measurement) was constructed, located so as to cover the zone where the caving had been most active for several years past. Since the completion of the work the main force of the current has been changed so that it now strikes the bank along the lower third of the completed revetment.

Delta Point, La., 598 miles below Cairo, right bank.—The object of this work is to hold the point opposite Vicksburg and prevent further recession of the channel downstream away from the harbor, and thus aid in the improvement of Vicksburg Harbor. It has an effective length of 5,900 feet, and is apparently in good condition. Considerable caving has recently taken place for some distance above the revetment, and it is possible that an extension upstream may be required in the near future to maintain the stability of the West Pass levee.

Reid-Bedford Bend, La., 603 miles below Cairo, right bank.—Work in this bend was provided for by an allotment made in August, 1906, and was designed to protect a long line of important levee from destruction by caving of the bank. This bend of the river is very unfavorable for either revetment or levee work. It has a sloughing bank, where large sections settle slowly and slide out; the adjacent land is low and swampy, and the current attains a high velocity in the deep water close to the bank. Each of the numerous sections of abandoned levees has its borrow pit, from which the impounded water seeps through the bank, assisting in its destruction.

Work was begun in 1906, when about 2,000 feet of revetment was placed; but on account of high stages of the river no upper-bank paving was possible. No work was done the following season. In 1908 the work was extended upstream about 1,400 feet, the upper bank graded and paved throughout the length of the old and new work, and a brushwork protection placed at each end. In 1909-10 the work was extended about 960 feet farther upstream. Work during the past season was under the fourth district, Mississippi River improvement, and consisted of the construction of about 1,880 feet of sectional mat extension at the upstream end of the work, together with repairs to the old work. The present effective length of this revetment is about 5,380 feet.

Red Fork, Arkansas River.—Revetment at this point was authorized in December, 1907, for the protection of the levee in order to avoid the construction of a long, expensive loop around Lake Belcoe. Work was begun in 1907 and extended in 1908, making its present effective length about 1,200 feet, all of which is in fair condition. Only minor repairs were made the past season.

Further details of revetment work in this district may be found in the report of Capt. Woodruff, hereto appended.

Fourth district, Warrenton, Miss., to Head of Passes, 607-1060 miles below Cairo.—Headquarters, Metropolitan Bank Building, New Orleans, La. District officer, Maj. H. Burgess, Corps of Engineers, United States Army.

The works include bank protection in Hard Times Bend, in Bondurant Chute, and in Kempe Bend, the improvement of the harbors at Natchez and Vidalia, rectification of Red and Atchafalaya Rivers, and improvement of the harbor at New Orleans, La. During the year the Reid-Bedford revetment and reach was temporarily in charge of the fourth district office, and the force and plant of the fourth district also constructed a portion of the Albemarle Bend revetment, both of these works being within the limits of the third district.

Hard Times Bend, La., 633 miles below Cairo, right bank.—The object of this work is to hold the caving bank and prevent the destruction of a levee across the foot of Lake St. Joseph, which would necessitate the building of a long and expensive loop back of the lake. In addition to the cost of constructing this new line of levee to replace the old one, the abandonment of the latter would result in the exposure to overflow of a large amount of cultivated land.

During the past season operations have been confined to clearing the timber off the bank to prevent its caving in and obstructing future revetment work. The bank was cleared over a length of 6,200 feet. Rapid caving still continues opposite the upper end of the levee across the lake.

Bondurant Chute, 644 miles below Cairo, right bank.—This work was undertaken in 1899 in order to prevent the destruction of the levee lying between the upper end of Lake Bruen and the bank of the river, no other location of the levee line being practicable in the immediate vicinity, and its abandonment involving the construction of a loop several miles long around and behind the lake. In addition to the cost of constructing this new line of levee to replace the old one, the abandonment of the latter would result in the exposure to overflow of a large amount of cultivated land.

The revetment consists of mattresses, constructed of lumber and willow brush, and a few experimental ones built entirely of lumber, for the submerged portion, with upper bank paving of concrete. The revetment has a total length of 3,550 linear feet and is in good condition.

No revetment work was necessary during the past year. As a whole the revetment is considered a complete work, requiring only current repairs and maintenance, and has resulted in the prevention of any further recession of the bank line at the revetment and consequent destruction of the levee.

Kempe Bend, 658 miles below Cairo, right bank.—The object of this work has been to prevent further erosion of the bank line in Kempe Bend, which has already destroyed several lines of levee and nearly reached a final line, the destruction of which would necessitate a long line of new levee of extremely difficult and costly construction. The construction of a new line would also require a long period of time, and a break in the front line in the meantime would be disastrous to a large section of the country below Kempe. Work on this revetment was begun in 1899 and continued each season since that time until, at the date of the last annual report of the commission, it had reached a length of 13,251 feet in two detached pieces; upper 11,146 feet long, and lower 2,105 feet long. The unprotected gap between has a length of about 10,000 feet.

During the year the upper revetment was extended upstream 900 linear feet and the lower revetment downstream 2,373 linear feet. The upper bank along the lower extension was graded and 1,430 linear feet was paved. The timber along the bank between the upper and lower revetments was cut to prevent its caving in and obstructing future work. The revetment has now a total length of 16,524 feet, in two detached pieces, upper 12,046 feet, and lower 4,478 feet, separated by an unprotected gap of about 10,000 feet.

The work has been successful thus far in protecting the levee, though numerous small failures of portions of the revetment have occurred, permitting the upper bank line to recede slightly. The present condition of the work is good.

Harbors at Natchez and Vidalia, Miss. and La., 688 miles below Cairo.—The object of this work is to prevent a threatened cut-off, which would destroy the harbors of Natchez and Vidalia and disturb the general regimen of the river for many miles above and below, and to prevent the destruction of the river front of the city of Natchez by caving of the bank.

The general project for this work, adopted in 1891, contemplated the construction of a levee on or near the axis of Cowpen Neck, to prevent a flow of water across the neck during high stages of the river, and the construction of about 16,000 linear feet of revetment in Giles Bend.

Work on the levee was begun in 1894 and completed in 1895, the levee being 19,500 feet long. The levee was raised and enlarged in 1898.

Work on the revetment was begun in 1897 and continued each season since that time until, at the date of the last annual report of the commission, it had reached a length of 21,848 linear feet, in two detached pieces of 8,592 and 13,256 feet, respectively.

During the past year the unprotected gap of about 1,606 feet between the upper and lower revetments was closed and extensive repairs were made to existing revetment. The levee on Cowpen Neck was cleared of weeds and briers.

The revetment in Giles Bend has now a continuous length of 23,454 feet, and the upper bank has been paved for a length of 17,000 feet. The work is in good condition.

Work on the Natchez front was begun in 1907, and there was constructed during the fiscal year 1907–8 two detached pieces of revetment, 1,150 and 1,400 feet long, respectively, with an unprotected interval of 2,000 feet length. The upper bank was graded for 1,794 linear feet and paved for 900 linear feet. No work was done during the past fiscal year, the revetment being in good condition.

Junction of the Mississippi, Red, and Atchafalaya Rivers, La., 764 miles below Cairo.—The improvement in this locality consists in the maintenance of mattress sill dams in the Atchafalaya River for the purpose of preventing the enlargement of that stream and dredging the low-water channel of Old River for the purpose of maintaining an adequate depth between the Mississippi, Red, and Atchafalaya Rivers.

The original sills were placed in 1887–88, and since that time no enlargement of the Atchafalaya has been observed. The dams are apparently in good condition, and beyond slight repairs to maintain them no further work is contemplated in this section.

During the past season dredging was required in lower Old River in order to maintain a suitable channel for navigation. Dredging on the bar at the Mississippi entrance to Old River was commenced on August 8 and ceased on October 5, when a channel of ample width and depth had been obtained.

Operations were successful and navigation was not interrupted or impeded at any time, although the river declined until the Red River Landing gauge read 3.8 and the Barbres 2.2. During the year the current in Old River has remained practically constant from the Mississippi toward the Atchafalaya.

New Orleans Harbor, 965 miles below Cairo, right and left banks.—The object of the work in this harbor is to prevent the erosion of banks and consequent loss and damage to adjacent property. The work consists mainly of spur dikes placed at intervals of about 450 feet, and of continuous revetment of the lower bank. In places where erosion was specially active continuous revetment was placed between the spurs.

Work under the present project was begun in 1883 and has continued each season, as funds were available, until at the date of the last annual report of the commission the banks were protected as follows: In Carrollton Bend, for 11,295 feet by continuous mattress, and for 2,035 feet by 5 spur dikes in conjunction with continuous mattress; in Greenville Bend, opposite Audubon Park, for 1,940 feet by 2 spur dikes, and for 1,570 feet at Amesville by continuous mattress; in the Gouldsboro-Algiers Bend, for 9,475 feet by 24 spur dikes; and in the third district reach, for 9,400 feet by 14 spur dikes in conjunction with continuous mattress. A total of about 6¾ miles of bank was thus protected by dikes and continuous revetment.

During the past year a total of 7,850 linear feet of revetment was constructed, of which 2,765 feet on the Gretna front was 300 feet wide, 3,975 feet in the Carrollton Bend was 200 feet wide, and 675 and 435 feet in the third district reach respectively 300 and 200 feet wide. The work in the Carrollton Bend consisted in extending the continuous mattress work of previous years, placed generally with its inshore edge along the 60-foot contour, up to low-water line.

The revetment in the Carrollton Bend now has a length of 13,330 feet and consists of 3,975 feet of continuous mattress 400 feet wide, 3,955 feet of continuous mattress 300 feet wide, 3,365 feet of continuous mattress 250 feet wide, placed generally with its inshore edge along the 60-foot contour; and 2,035 feet protected with 5 submerged sloping spur dikes in conjunction with continuous mattress. In the Greenville Bend there is now 1,570 linear feet of continuous mattress 300 feet wide; on the Gretna front, 2,795 linear feet of continuous mattress 300 feet wide; in the Gouldsboro Bend, 9,475 linear feet protected by 24 submerged sloping spur dikes; in the third district reach, 9,400 linear feet of continuous mattress from 300 to 400 feet wide in conjunction with 16 submerged sloping spur dikes, and 1,110 linear feet of continuous mattress from 200 to 300 feet wide. The total length of bank protected wholly or in part is 37,680 linear feet, about 7⅛ miles. The 1,940 linear feet nominally protected by 2 spur dikes placed in the Greenville Bend in 1889 and 1890 is omitted from the total, since these dikes, although apparently intact, have been flanked and the caving is continuing back of them. About 300 linear feet of mattress in the Carrollton Bend has slipped down the hard clay bank, which has an inclination of 1 in 2. With the exceptions noted all of the work so far as is known is in good condition.

The steep banks and great depths of water make the preservation of the banks in New Orleans Harbor both difficult and expensive, and the danger of sudden collapse in certain localities is by no means remote. Under the conditions here found it is of more than ordinary importance that ample means should be provided for the extension and completion of the revetment necessary to make the river banks along the city front reasonably safe.

For further details concerning the work in this district see the report of Maj. Burgess, appended hereto.

PLANT.

First and second districts.—The plant belonging to the first and second districts is laid up and cared for, when not in use in the field, below the Memphis bridge on the Tennessee shore. Eleven material barges and two mat barges have been added during the year, and two quarterboats, one hydraulic grader, one derrick boat, and one material barge are now under construction at the fleet, and four steel material barges under contract. The plant has been decreased by one material barge, one motor boat, and seven skiffs. Repairs necessary to keep the plant in good condition were made during the year. The plant generally is in fair condition.

For further details concerning plant of the first and second districts reference is invited to the report of Capt. Smith, hereto appended.

Third district.—During the past year four steel barges and a steel floating dry dock, built under contract, and a quarter boat, built at the yards of the Rock Island, Ill., district, were completed.

General repairs to plant were made during the year. The construction of additional plant, so that the district will have an outfit for four independent revetment parties, is contemplated.

For further details regarding the plant of the district see report of Capt. Woodruff, hereto appended.

Fourth district.—The plant pertaining to the fourth district is cared for at New Orleans, La. General repairs have been made to the entire plant and it is now in good condition. During the year one hydraulic grader, one derrick boat, three quarter boats, and eight standard barges were built by hired labor, and a steel hull towboat was constructed under contract.

For further details of the plant in the fourth district reference is made to the report of Maj. Burgess, hereto appended.

Plant in charge of the secretary.—The steamer *Mississippi*, used for the inspection trips of the commission, the steamers and quarter boat used in the general surveys, and the dredges, with the steamers, towboats, pile sinkers, and barges used in connection with the dredging operations are cared for at West Memphis, Ark., where a general supply and repair depot has been established. Necessary repairs have been made during the year and the plant maintained in good condition.

One steamboat, the *General T. L. Casey*, ran on a hidden obstruction when entering Old River last November and sank in about 4 feet of water. As the hull was old and the planking and timbers unsound, she proved a total loss, with the exception of the boilers and machinery, which were removed and taken to West Memphis.

The construction of the dry dock at the dredge depot at West Memphis was completed during the year. This dock is of the side-haul railway type, and has been tested under working conditions with satisfactory results except in some minor details which are now being adjusted.

For details concerning this plant see report of Lieut. Col. Potter, appended hereto.

STONE.

For the purpose of furnishing stone for revetment works in the third district, a stone quarry near Searcy, Ark., purchased by the United States in 1899, is operated when towing stages exist in Little Red and White Rivers. Operations at the quarry this year were begun March 7, 1911, and it is expected to obtain about 20,000 cubic yards of stone during the present season.

Details of the year's operations are given in the report of Capt. Woodruff, hereto appended.

Stone for use in the other districts has been purchased.

Details on this subject are given in the reports of the district officers, hereto appended.

SURVEYS IN THE ENGINEER DISTRICTS.

In order to keep in close touch with the conditions of the improvement works, the caving banks, and changes affecting the regimen of the river, annual surveys are made, covering mainly portions of the river under improvement. The discussion of the results will be found in the reports of the district officers herewith.

The annual survey of Old River and vicinity was omitted this year by the fourth district officer, as it was included in the survey of that vicinity made by the secretary.

LEVEES.

For convenience in administration and the allotment of funds for levee purposes, the river front has been divided by the commission into levee districts. The names and locations of these districts as authorized by the commission will be found on pages 2620–2621 of the Report of the Chief of Engineers for 1907, except the Homochitto district, which is defined below.

The following table, which is similar to that given in last year's report, has been brought up to date, and shows the present condition of the levees and the levee operations during the past year as compiled from the reports of the district officers:

Levee district.	In system.	Built.	Contents, 1910.	Built since by United States.	Built since by local authorities.	Total built since 1910.
	Miles.	*Miles.*	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*
Upper St. Francis	90.00	55.00	3,022,335	360,037	116,050	476,087
Lower St. Francis	212.00	207.50	25,312,143	420,046	296,531	716,577
White River	74.00	74.00	11,030,281	193,826	122,000	315,826
Reelfoot	21.00	21.00	1,583,422	130.036	None.	130,036
Upper Yazoo	124.00	124.00	30,443,758	191,074	240,265	431,339
Lower Yazoo	207.00	188.60	43,720,939	906,496	1,275,833	2,182,329
Upper Tensas	192.90	190.00	37,577,738	643,754	1,140,297	1,784,051
Lower Tensas	157.54	150.59	23,966,736	931,517	666,535	1,598,052
Atchafalaya	127.22	127.22	22,173,899	None.	379,466	379,466
Lafourche	82.23	82.23	9,657,969	35.801	182,315	218,116
Barataria	71.88	71.88	3,699,565	22,450	31,519	53,969
Pontchartrain	125.78	125.78	18,654,208	382,307	265,747	648,054
Lake Borgne	78.10	78.10	4,251,911	131,175	207,939	339,114
Total	1,565.25	1,495.90	235,094,904	4,348,518	4,924,497	9,273.015

Levee district.	Lost or abandoned during the year.	Contents, 1911.	Required to complete.	Estimated final contents.	Per cent now built.	Approximate area protected.
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*		*Sq. mi.*
Upper St. Francis	49,700	3,448,722	7,550,382	10,999,104	81.3	700
Lower St. Francis	12,324	26,016,396	5,519,600	31,535,996	82.5	3,500
White River	None.	11,346,107	5,524,136	16,870,243	67.3	910
Reelfoot	None.	1,713,458	954,088	2,667,546	64.2	310
Upper Yazoo	240,700	30,634,397	Completed.	30,634,397	100.0	3,281
Lower Yazoo	1,200,000	44,703,267	9,613,000	54,316,267	82.3	3,367
Upper Tensas	40,000	39,321,789	8,700,000	48,021,789	81.0	2,500
Lower Tensas	917,400	[1] 24,647,388	5,629,989	30,277,377	81.9	2,080
Atchafalaya	191,350	[2] 22,362,015	3,274,384	25,636,399	87.2	6,065
Lafourche	103,642	9,772,443	1,659,551	11,431,994	85.5	2,040
Barataria	37,869	3,715,665	1,349,070	5,064,735	73.3	
Pontchartrain	359,712	[3] 18,942,550	2,677,872	21,620,422	87.6	1,816
Lake Borgne	174,704	4,416,321	1,421,309	5,837,630	75.6	
Total	3,327,401	241,040,518	53,873,381	294,913,899	81.7	26,569

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[1] This amount includes 52,819 cubic yards placed on the new Greens Levee previous to May 1, 1910. The amounts 52,819 (Greens) and 53,551 (Gem) were not included in last year's report on account of levee not being completed and old levee being controlling line.

[2] 62,351 cubic yards placed in the new Allendale Levee not included in this amount on account of levee not being completed and old levee being controlling line.

[3] This amount includes 53,551 cubic yards placed in the new Gem Levee previous to May 1, 1910. The amounts 52,819 (Greens) and 53,551 (Gem) were not included in last year's report on account of levee not being completed and old levee being controlling line.

The "estimated final contents" of the levees given above is based on grades and sections, as provisionally recommended by the commission.

The loss of levee by abandonment on account of caving river banks or for other causes during the past year, as shown in the above table, was 3,327,401 cubic yards, which amounts to about 1⅜ per cent of the contents of the existing levees. About one-third of this is in the Lower Yazoo and somewhat less than one-third in the Lower Tensas Levee districts.

In addition to the levee districts given in the foregoing table, there is the Homochitto Levee district authorized by the commission extending on the left bank from mouth of Yazoo River to Baton Rouge. A survey was made of portions of this district during the year, but no levee work has ever been done in it by the commission.

High water.—During the high-water season of 1911 the river reached only moderately high stages, and these were of short duration. No breaks occurred in any of the levees above New Orleans. Below New Orleans a strong east wind caused the waters to pile up in the river to a height, in some places, within a foot of the highest known water. The large waves caused by this wind on April 26 damaged the levee revetment throughout the Barataria and Lake Borgne districts and washed the slopes of the levee, causing four small breaks in the levee at Metcalf (1030) in the Barataria district. These breaks were promptly closed.

The highest gauge readings of this year at selected stations, comprising mainly those at the mouths of the larger tributaries, are given in the following table:

Station.	Highest gauge reading 1911.		Highest known gauge reading.		1911 lower than highest known.	Highest gauge reading 1910.	1911 higher than 1910.
	Date.	Height.	Year.	Height.			
		Feet.		*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo	Apr. 20–21	45.46	1883	52.17	6.71	42.15	3.31
Memphis	Apr. 25, 26	36.41	1907	40.30	3.89	33.12	3.29
Helena	Apr. 28, 29	44.55	1897	51.75	7.20	40.70	3.85
Mouth White River	May 1–2	48.33	1903	53.70	5.37	44.45	3.38
Vicksburg	May 6	45.13	1897	52.48	7.35	40.60	4.53
Red River Landing	May 12	42.70	1897	50.20	7.50	38.50	4.20
Carrollton	May 15	14.72	1903	19.42	4.70	12.85	1.87
Fort Jackson	May 15–17, 18	[1] 7.00	1907	8.30	1.30	6.24	.76

[1] High winds from the Gulf on Apr. 26 caused a stage of 7.4 feet.

Additional details regarding this subject will be found in the reports of the district officers appended hereto.

REVETMENTS FOR THE PROTECTION OF LEVEES AND THEIR IMPORTANCE IN THE DEVELOPMENT OF NAVIGABLE CHANNELS.

This subject was fully discussed by the commission in its annual report for 1908 on pages 2654 to 2656. In accordance with the views expressed therein, work of this kind has been continued and has been done during the year, as already described herein, at Walnut Bend (281), Old Town Bend (324), Panther Forest (452), Vaucluse

(487), Fitlers Bend (550), Albemarle Bend (568), Reid-Bedford (603), and Kempe Bend (658). The results of these works have been very satisfactory at the various localities and seem to fully justify their construction. The total length of existing revetment is given in the following table:

Mississippi River, mouth of the Ohio River to Head of the Passes—Effective length of bank protection, June, 1911.

Localities.	Miles below Cairo.	Bank of river.	Revetment in place.
			Linear feet.
Columbus, Ky	21	Left	1,920
Hickman, Ky	36	Left	1,450
New Madrid, Mo	71	Right	4,450
Caruthersville, Mo	110	Right	2,342
Plum Point Reach:			
Daniels Point, Ark	152	Right	5,000
Ashport, Tenn	155–159	Left	21,300
Fletchers Bend, Ark	158–161	Right	17,250
Osceola, Ark	163–165	Right	2,550
Bullerton Bar, Ark	168	Right	14,500
Hopefield Bend, Ark	227–230	Right	14,800
Memphis, Tenn	230–232	Left	16,000
Walnut Bend, Ark	280	Right	7,010
Helena, Ark	306	Right	4,900
Old Town Bend, Ark	325	Right	8,955
Red Fork, Ark	402	Right	1,200
Lake Bolivar Front	417	Left	3,550
Ashbrook Neck	446	Left	10,100
Panther Forest	452	Right	4,150
Leland Neck, Ark	471	Right	4,300
Greenville, Miss	478	Left	12,500
Vaucluse, Ark	487	Right	2,700
Longwood, Miss	500	Left	4,200
Lake Providence Reach:			
Louisiana Bend	522	Right	11,300
Lake Providence, La	540	Right	12,000
Fitlers Bend, Miss	550	Left	3,200
Albemarle Bend, Miss	568	Left	11,650
Delta Point, La	598	Right	5,900
Reid-Bedford Bend, La	603	Right	5,380
Bondurant	644	Right	3,550
Kempe	656–661	Right	16,524
Giles Bend	686–691	Left	23,454
Natchez Front	700	Left	2,550
New Orleans Harbor	960–970		
Carrollton		Left	13,800
Greenville		Right	1,570
Gretna Front		Right	2,795
Gouldsboro-Algiers		Right	9,475
Third District		Left	10,500
			[1] 298,775

[1] Equal to 56.59 miles.

NOTE.—In addition to the above there is about 1,500 linear feet of effective bank protection at Plaquemine, La., 854 miles below Cairo. This work was done in connection with the lock at that place.

REVETMENTS FOR THE PROTECTION OF CITY FRONTS AND HARBORS.

The position of the commission in regard to allotments for work for this purpose was fully stated in its annual report for 1908. During the year allotments have been made where the necessity was most urgent.

RECOMMENDED APPROPRIATION.

The levee system which now protects 26,000 square miles of alluvial lands in the valley of the Mississippi River below Cairo is the product of cooperative expenditures by the United States and the riparian communities extending over a period of nearly 30 years. Without these levees the whole valley would be inundated in great floods. They have been effective to restrain the floods for eight years past. To accomplish this result it has been necessary to make them so high and massive that the cost of replacing them when destroyed is very great, especially in those places (of which there are many) where they can not be replaced without going around a lake or swamp, across which the building of a levee is all but impossible. The caving of the river banks and consequent shifting of its channel is continually exposing these costly embankments to destruction, unless such caving is arrested by revetment of the banks.

Every revetment which thus saves a levee also serves other useful purposes. The bars which obstruct navigation are replenished from the caving banks. By diminishing the caving, the revetment diminishes the production of bar-building material. The revetments are so necessary to the permanent improvement of the channel that it would be worth while to build them if there were no levees to be protected.

These considerations have made it apparent for several years past that a time was nearly at hand for a readjustment of the relations of the United States and the riparian organizations to the general work of improvement, by which the riparian communities should assume the burden of maintaining the levees without assistance from the United States, and the United States should assume the work of protecting them from undermining by caving banks. This situation has been fully set forth in previous reports of the commission and by members of the commission in hearings before committees of Congress.

The river and harbor act approved June 25, 1910, recognized these conditions and appropriated $2,000,000 for continuing improvement below Cairo, in addition to $2,000,000 already provided for by previous acts and which was appropriated in the sundry civil act of June 25, 1910, thus making for the fiscal year 1911 the sum of $4,000,000. As understood by the commission, this appropriation was intended as the inauguration of a policy by which the works of improvement on the Mississippi River would be carried forward to completion as rapidly as would be consistent with economy. The language of the appropriation was continuing improvement with a view to securing a permanent channel depth of 9 feet and to the completion of said improvement within a period of 20 years. Such a policy, applied to the Mississippi River below Cairo, involves a large increase in revetment plant, and in the expenditure of the appropriation of $4,000,000 for the year 1911 initial steps were taken toward such an increase. But the appropriation for the year ending June 30, 1912, was reduced to $3,000,000, and the plans which the commission had formed to carry out what it believed to be the will of Congress were deranged. The readjustment of relations between the riparian communities and the United States was postponed. It had been the effort of the commission throughout its history to require from the riparian owners the largest possible self-help as a condition of receiving allotments for the construction and maintenance of levees from the appropriations made by Congress, and this with a view to the ultimate assumption of the whole burden by them. The time is near by for the realization of that expectation, provided the United States will protect the existing levees from undermining by caving. But if the commission should be unable for want of adequate funds to build the revetments as they may become necessary for that purpose, the basis of the readjustment will be broken up, and to the extent to which the people may be unable to replace levees destroyed by caving the United States will have to assist.

Reference may be made here to one great revetment built within the past two years as an illustration of the double uses of this form of improvement. At Albemarle Bend, Miss., the bank had been caving at the rate of about 500 feet per annum for four years. Between August, 1910, and March, 1911, the bend was covered by a revetment 11,650 feet long. The caving had already undermined part of the threatened levee before the work was begun and that much had to be replaced by a loop. But the bend is now securely protected, and the revetment has stopped the dumping into the river bed of approximately 11,000,000 cubic yards per annum of bar-building material, there to form obstructions to navigation and to raise the flood heights.

It is in view of these weighty considerations that the commission recommends an appropriation of $4,000,000 for continuing improvement below Cairo, with all of the emphasis permissible to it in such a recommendation.

ESTIMATE OF ADDITIONAL FUNDS REQUIRED.

Amount that can be profitably expended in fiscal year ending June 30, 1913, exclusive of the balance unexpended July 1, 1911:

For continuing the improvement of Mississippi River from Head of Passes to the mouth of the Ohio River, including salaries and clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission, $4,000,000.

Respectfully submitted.

Wm. T. Rossell,
Colonel, Corps of Engineers, United States Army,
Acting President, Mississippi River Commission.
Robert S. Taylor.
J. A. Ockerson.
Homer P. Ritter,
Assistant, United States Coast and Geodetic Survey.
J. G. Warren,
Lieut. Col., Corps of Engineers, United States Army.
C. H. West.
C. McD. Townsend,
Colonel, Corps of Engineers, United States Army.

The Chief of Engineers, United States Army.

Money statements.

APPROPRIATIONS EXPENDED UNDER MISSISSIPPI RIVER COMMISSION.

Appropriation for improving Mississippi River.

July 1, 1910, balance unexpended		[1] $4,661,347.32
Amount appropriated by river and harbor act approved Feb. 27, 1911	$3,000,000.00	
Miscellaneous receipts from reimbursements, sales of engineer property under the provisions of section 5 of river and harbor act of June 13, 1902, and other sales	10,894.56	
		3,010,894.56
		7,672,241.88
June 30, 1911, amount expended during fiscal year		3,373,270.26
July 1, 1911, balance unexpended		4,298,971.62
July 1, 1911, outstanding liabilities	$255,472.80	
July 1, 1911, amount covered by uncompleted contracts	637,793.51	
		893,266.31
July 1, 1911, balance available		3,405,705.31

Distributed as follows:

Mississippi River Commission	37,890.14
Surveys, gauges, and observations	127,961.61
Levees	130,007.53
Revetment and contraction works, permanent channel improvements, and protection	1,182,980.63
Dredges and dredging	514,679.46
Plant and miscellaneous	626,804.42
Improving harbors and tributaries	348,381.52
Allotments subject to approval July 1, 1911	425,000.00
Unallotted	12,000.00
	3,405,705.31

Amount that can be profitably expended in fiscal year ending June 30, 1913, exclusive of the balance unexpended July 1, 1911

For continuing the improvement of the Mississippi River from Head of the Passes to the mouth of the Ohio River, including salaries and clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission	$4,000,000.00

Appropriation for gauging waters of the Mississippi River and its tributaries.[2]

July 1, 1910, balance unexpended	$1,984.95
Amount allotted by Chief of Engineers, July 27, 1910, from permanent annual appropriation made by section 6 of river and harbor act of Aug. 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902	9,600.00
	11,584.95

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[1] The amount, $4,661,347.29, reported in Annual Report for 1910, has been increased 3 cents by refundment in July, 1910, of overpayment of that amount by first and second districts officer, allotment for "White River levee district."

[2] The custody and care of the gauges maintained under this appropriation were assumed by the Mississippi River Commission Feb. 11, 1901, on which date they were transferred to the secretary, under authority of Secretary of War, dated Jan. 25, 1901.

June 30, 1911, amount expended during fiscal year	$8,744.71	
June 30, 1911, amount reverted to Treasury during fiscal year	546.18	
		$9,290.89
July 1, 1911, balance unexpended		2,294.06
July 1, 1911, outstanding liabilities	945.48	
July 1, 1911, amount covered by uncompleted contracts	23.42	
		968.90
July 1, 1911, balance available		1,325.16
Amount that can be profitably expended in fiscal year ending June 30, 1913, exclusive of the balance unexpended July 1, 1911		9,100.00

Itemized statement of expenditures during the fiscal year ending June 30, 1911, submitted in compliance with requirement of section 6 of river and harbor act of August 11, 1888.

Observations:		
Pay of permanent gauge observers		$3,600.00
Inspections and repairs:		
Inspection of gauges on Mississippi River by junior engineers and parties on steamers	$2,132.98	
Inspection of gauges on tributaries	435.62	
Renewals and repairs of gauges and bulletins	375.95	
		2,944.55
Instruments:		
Purchase of carrying case		3.25
Office expenses and contingencies:		
Pay of assistant and junior engineers, recorders, and clerks	1,847.08	
Stationery, printing, office rent, etc	349.83	
		2,196.91
		8,744.71

CONSOLIDATED STATEMENT OF ALL APPROPRIATIONS EXPENDED UNDER THE MISSISSIPPI RIVER COMMISSION TO JUNE 30, 1911.

Appropriations for improving Mississippi River.

Act of June 28, 1879 (organic)	$175,000.00
Act of June 16, 1880 (sundry civil)	150,000.00
Act of Mar. 3, 1881 (river and harbor)	1,000,000.00
Act of Mar. 3, 1881 (sundry civil)	150,000.00
Act of Aug. 2, 1882 (river and harbor)	4,123,000.00
Act of Aug. 7, 1882 (sundry civil)	150,000.00
Act of Mar. 3, 1883 (sundry civil)	150,000.00
Act of Jan. 19, 1884	1,000,000.00
Act of July 5, 1884 (river and harbor)	75,000.00
Act of July 5, 1884 (river and harbor), less $5.000 transferred to snagboat service	2,065,000.00
Act of July 7, 1884 (sundry civil)	75,000.00
Act of Aug. 5, 1886 (river and harbor), less $5,942.60 for expenses, office Chief of Engineers	1,994,057.40
Act of Aug. 5, 1886 (river and harbor), less $47.30 for expenses, office Chief of Engineers	29,952.70
Act of Aug. 11, 1888 (river and harbor), less $4,859.00 for expenses, office Chief of Engineers	2,840,141.00
Act of Aug. 11, 1888 (river and harbor)	75,000.00
Act of Oct. 2, 1888 (sundry civil)	35,000.00
Act of Oct. 19, 1888 (deficiency), less $4,214.39 reverted to the Treasury	20,785.61
Act of Sept. 19, 1890 (river and harbor)	3,200,000.00
Act of Sept. 30, 1890 (deficiency)	5,625.00

Act of Mar. 3, 1891 (deficiency)		$1,950.00
Joint resolution approved Mar. 3, 1891 (Public, No. 19)		1,000,000.00
Act of July 13, 1892 (river and harbor)		2,470,000.00
Act of July 28, 1892 (deficiency)		44.80
Act of Mar. 3, 1893 (sundry civil)		2,665,000.00
Act of Aug. 18, 1894 (river and harbor)		485,000.00
Act of Aug. 18, 1894 (sundry civil)		2,665,000.00
Act of Mar. 2, 1895 (sundry civil)		2,665,000.00
Act of June 3, 1896 (river and harbor)		909,000.00
Joint resolution approved Mar. 31, 1897 (Public, No. 6)		250,000.00
Act of June 4, 1897 (sundry civil)		2,933,333.00
Act of July 19, 1897 (deficiency)		625,000.00
Act of July 1, 1898 (sundry civil)		1,983,333.00
Act of Mar. 3, 1899 (sundry civil)		2,583,333.00
Act of Mar. 3, 1899 (river and harbor)		185,000.00
Act of June 6, 1900 (sundry civil), less $5,000.00 for expenses, office Chief of Engineers		2,245,000.00
Act of June 13, 1902 (river and harbor)		2,200,000.00
Act of Mar. 3, 1903 (sundry civil)		2,000,000.00
Act of Apr. 28, 1904 (sundry civil)		2,000,000.00
Act of Mar. 3, 1905 (river and harbor)		1,000,000.00
Act of Mar. 3, 1905 (sundry civil)		2,000,000.00
Act of June 30, 1906 (sundry civil)		2,000,000.00
Act of Mar. 2, 1907 (river and harbor)		3,000,000.00
Act of May 27, 1908 (sundry civil)		2,000,000.00
Act of Mar. 4, 1909 (sundry civil)		2,000,000.00
Act of June 25, 1910 (sundry civil)		2,000,000.00
Act of June 25, 1910 (river and harbor)		2,000,000.00
Act of Feb. 27, 1911 (river and harbor)		3,000,000.00
Total specific appropriations		66,179,555.51
Balances from former appropriations applied to works below Cairo under act of Aug. 2, 1882, less $123.42 reverted to Treasury	$272,504.96	
Same for works above Cairo, under act of July 5, 1884	22,632.53	
Total balances		295,137.49
Miscellaneous receipts:		
Previously reported	39,555.59	
Amount received by transfer from appropriation for improving Arkansas River, Ark. (dredging), for fuel and miscellaneous supplies furnished the dredging plant on the Arkansas River, in 1907 and 1908, credited to "Dredges and dredging," secretary's office, July, 1910	5,745.61	
Amount received by transfer from appropriation for removing obstructions in the Mississippi, Atchafalaya, and Old Rivers, 1911, for coal furnished the U. S. snagboat *J. N. Macomb*, credited to "Dredges and dredging," secretary's office, February, 1911	60.00	
Amount received by transfer from appropriation for improving Mississippi River from mouth of Ohio River to Minneapolis, Minn. (mouth of Missouri to Minneapolis, general improvement), for expenses incurred in obtaining discharge measurements of the upper Mississippi River, credited to "Surveys, gauges, and observations," secretary's office, May, 1911	285.00	
Amounts transferred from appropriations for improving White River, Ark. ($176.18), improving Arkansas River, Ark. ($352.37), for docking and repairing U. S. snagboat *C. B. Reese*, credited to "Dredges and dredging," secretary's office, June, 1911	528.55	

Amount received in compromise of claim against the Talley-Bates Construction Co. on account levee work, credited to "White River levee district," first and second districts, November, 1910	$2,000.00	
Amounts received from sales of engineer property under the provisions of section 5 of river and harbor act of June 13, 1902, and sales of blue prints:		
By first and second district officer—		
From sale of engineer property, credited to "Plant," October, 1910	174.75	
From sale of blue prints, credited to "Surveys, gauges, and observations," June, 1911	.25	
By third district officer—		
From sale of engineer property, credited to "Plant," September, 1910	340.00	
By fourth district officer—		
From sales of engineer property, credited to allotments indicated in months named:		
August, 1910, "Plant"	208.55	
May, 1911, "Plant"	505.00	
June, 1911, "Plant"	1,040.00	
From sales of blue prints, credited to allotments indicated in months named:		
July, 1910, "Surveys, gauges, and observations" ($1), "Lower Tensas levee district" (25 cents), "Atchafalaya levee district" ($1.50)	2.75	
October, 1910, "Barataria levee district"	.50	
January, 1911, "Lower Tensas levee district" ($1), "Homochitto levee district" (85 cents)	1.85	
April, 1911, "Surveys, gauges, and observations" ($1.50), "Homochitto levee district" (25 cents)	1.75	
Total miscellaneous receipts		$50,450.15
Total		66,525,143.15

EXPENDED.

Location and object.	To June 30, 1910.	During year ending June 30, 1911.	Total.
Mississippi River Commission	$897,919.48	$32,432.90	$930,352.38
Surveys, gauges, and observations	2,552,277.18	81,201.05	2,633,478.23
Levees	[1] 24,753,771.68	981,868.15	25,735,639.83
Revetment and contraction works, permanent channel improvements and protection	13,021,577.28	1,024,754.50	14,046,331.78
Dredges and dredging	5,306,768.93	344,980.97	5,651,749.90
Experimental dikes	100,000.00		100,000.00
Plant and miscellaneous	3,537,322.93	518,452.77	4,055,775.70
Improving harbors and tributaries except Vicksburg Harbor	7,362,650.28	389,579.92	7,752,230.20
Improving Vicksburg Harbor	582,980.98		582,980.98
Works above Cairo	737,682.53		737,682.53
Total expended	58,852,901.27	3,373,270.26	62,226,171.53
Balance unexpended June 30, 1911			3,861,971.62
Allotments subject to approval July 1, 1911			425,000.00
Unallotted			12,000.00
Total appropriated, etc			66,525,143.15

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[1] The amount, $24,753,771.71, reported in annual report for 1910 is reduced 3 cents by refundment in July, 1910, of overpayment of that amount by first and second districts officer, allotment for "White River levee district."

Appropriation for gauging waters of the Mississippi River and its tributaries.

Allotments from general appropriations for examinations, surveys, and contingencies of rivers and harbors by acts of—	
Mar. 3, 1871 (allotment Apr. 11, 1871)	$5,000.00
June 10, 1872 (allotment July 11, 1872)	5,000.00
Mar. 3, 1873 (allotment May 17, 1873)	5,000.00
June 23, 1874 (allotment July 29, 1874)	5,000.00
Mar. 3, 1875 (allotment Mar. 22, 1875)	5,000.00
Specific appropriations by river and harbor acts of—	
Aug. 14, 1876	5,000.00
June 18, 1878	5,000.00
Mar. 3, 1879	5,000.00
June 14, 1880	5,000.00
Mar. 3, 1881	5,000.00
Aug. 2, 1882	5,000.00
Deficiency act of Mar. 12, 1884	2,100.00
Specific appropriations by river and harbor acts of—	
July 5, 1884	5,000.00
Aug. 5, 1886	5,000.00
Allotted from specific appropriation by river and harbor act of Aug. 11, 1888 (allotment Oct. 17, 1888)	8,700.00
Deficiency act of Oct. 19, 1888	3,600.00
Allotments from permanent indefinite appropriation made by section 6 of river and harbor act of Aug. 11, 1888, for fiscal years, viz:	
1890 (allotment Aug. 23, 1889)	9,000.00
1891 (allotment Aug. 19, 1890, $8,700, less $3,518.34 withheld in United States Treasury under ruling that only $6,000 can be expended each fiscal year)	5,181.66
1892 (allotment July 17, 1891)	5,100.00
1893 (allotment July 15, 1892)	5,500.00
1894 (allotment July 18, 1893)	5,500.00
1895 (allotment June 5, 1894)	5,500.00
1896 (allotment June 4, 1895)	5,500.00
1897 (allotment May 13, 1896)	5,500.00
1898 (allotment June 16, 1897)	5,500.00
1899 (allotments May 27, 1898, $5,500; July 12, 1898, $500)	6,000.00
1900 (allotment June 1, 1899)	5,500.00
1901 (allotment July 2, 1900)	6,000.00
1902 (allotment July 31, 1901)	6,000.00
Allotments from permanent annual appropriation made by section 6 of river and harbor act of Aug. 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902, for fiscal years, viz:	
1903 (allotment July 23, 1902, $9,600, less $500 allotted Aug. 2, 1902, to St. Paul, Minn., district)	9,100.00
1904 (allotment Apr. 18, 1903)	9,100.00
1905 (allotment Aug. 11, 1904)	9,100.00
1906 (allotment June 30, 1905)	9,100.00
1907 (allotment July 2, 1906)	9,100.00
1908 (allotment July 24, 1907)	9,100.00
1909 (allotment July 3, 1908)	9,100.00
1910 (allotment July 13, 1909)	9,100.00
1911 (allotment July 27, 1910)	9,600.00
Total	237,581.66

EXPENDED.

	To June 30, 1910.	During year ending June 30, 1911.	Total.
Expenditures	$212,629.76	$8,744.71	$221,374.47
Unexpended balances reverted to Treasury	13,366.95	546.18	13,913.13
Total	225,996.71	9,290.89	235,287.60
Unexpended balance June 30, 1911			2,294.06
Total appropriated, etc			237,581.66

Appropriation for repairing Government levee at Walnut Bend, Ark.[1]

Act of June 13, 1902 (river and harbor)	$90,000.00
Expended to June 30, 1906	90,000.00

Appropriation for waterway from Lockport, Ill., to St. Louis, Mo.

Act of June 13, 1902 (river and harbor)		$25,000.00
Amount transferred from allotment for "Survey of Illinois and Des Plaines Rivers, Ill.," as reimbursement		1,093.40
Total		$26,093.40
Expended to June 30, 1906	$22,291.23	
Unexpended balance carried to surplus fund on June 30, 1909, under the provisions of section 10 of sundry civil act of Mar. 4, 1909	3,802.17	
		26,093.40

Appropriation for emergencies in river and harbor works.

Allotments from appropriation by act of Apr. 28, 1904—	
For Wolf River (allotment July 6, 1904)	$8,000.00
For Giles Bend, Miss. (allotment July 6, 1904)	40,000.00
	48,000.00
Expended in fiscal year 1905	48,000.00
Allotments from appropriation by act of Mar. 3, 1905—	
For Old River (allotments Oct. 5, 1908, $6,000, and Nov. 12, 1908, $4,000)	10,000.00
Expended in fiscal year 1909	10,000.00

Appropriation for examinations, surveys, and contingencies of rivers and harbors.

Allotments from appropriation by river and harbor act of Mar. 3, 1905—	
For Ashport, Tenn. (allotments Mar. 29, 1905, $25, and May 8, 1905, $460)	$485.00
Expended in fiscal year 1906	485.00

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[1] Prior to June 30, 1906, was reported under appropriation for "Improving Mississippi River."

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911.

SECRETARY, MISSISSIPPI RIVER COMMISSION.

Appropriations: Improving Mississippi River; gauging waters of the Mississippi River and its tributaries; waterway from Lockport, Ill., to St. Louis, Mo.]

	Appropriation for improving Mississippi River, allotment for—				
	Mississippi River Commission.	Surveys, gauges, and observations.	Dredges and dredging.	Expended allotments.	Total.
Amount expended on previous projects	$238,110.74	$855,247.37	....	....	$1,093,358.11
Amount expended on present project to end of last fiscal year.	659,808.74	1,294,846.10	$4,916,164.82	[1] $46,131.14	6,916,950.80
Balance unexpended at end of last fiscal year	35,975.51	71,792.85	507,924.65	....	615,693.01
Amount appropriated or allotted since (net)	[2] 35,000.00	[3] 111,285.00	[4,5] 388,722.25	....	535,007.25
	70,975.51	183,077.85	896,646.90	....	1,150,700.26
Amount expended from beginning of present fiscal year to end of previous month	29,875.82	59,986.01	[6] 327,106.72	....	416,968.55
Amount expended during the month	2,557.08	[7] 6,697.97	[8] 17,874.25	....	27,129.30
	32,432.90	66,683.98	344,980.97	....	444,097.85
Balance unexpended at end of month	38,542.61	116,393.87	551,665.93	....	706,602.41
In Treasury United States	35,936.67	110,865.77	516,279.53	....	663,081.97
In hand	2,605.94	5,528.10	35,386.40	....	43,520.44
	38,542.61	116,393.87	551,665.93	....	706,602.41
Outstanding liabilities at end of month	537.06	3,080.63	33,836.20	....	37,453.89
Amount covered by existing contracts at end of month	115.41	187.34	3,150.27	....	3,453.02
	652.47	3,267.97	36,986.47	....	40,906.91
Balance available at end of month	37,890.14	113,125.90	514,679.46	....	665,695.50

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[1] Experimental dikes, $45,075.58; patrol of the Mississippi River, $1,055.56.

[2] Amount previously reported increased $30,000
[3] Amount previously reported increased $66,000
[4] Amount previously reported increased $329,000
Allotments from appropriation by river and harbor act of Feb. 27, 1911, by resolution of the Mississippi River Commission, Apr. 20, 1911 (proc., p. 1715), approved by the Assistant Secretary of War, May 3, 1911. (ED 15927-312, Sec. MRC 223-42.)

[5] Amount previously reported increased $528.55 received by Treasury transfer settlement No. 14052, June 3, 1911, from the appropriation, Improving White River, Ark., $176.18, improving Arkansas River, Ark., $352.37; for docking and repairing U. S. snagboat C. B. Reese (ED 32777-25, Sec. MRC 1422-1415). Amount previously reported increased $3,837.10 by transfer from allotments for first and second districts in payment for coal furnished by the Secretary (ED 60343-12, Sec. MRC 354-49).

[6] Amount previously reported reduced as follows: Refund of overpayments on Voucher No. 2, December, 1910, $20, and Voucher No. 18, May, 1911, 67 cents.

[7] Includes $90 in Treasury settlement No. 14121, June 14, 1911, for services of Chas. W. Clark, deceased (ED 81127-3, Sec. MRC 1465-1464). Includes $44.23, in Treasury transfer settlement No. 14207, June 20, 1911, to the credit of the appropriation, Improving Tennessee River below Chattanooga, Tenn., Alabama and Kentucky (between Chattanooga and Riverton), in payment for subsistence stores and gasoline furnished to a working party sent out by the Mississippi River Commission (ED 30356-267, Sec. MRC 1454-21).

[8] Includes $3.36 in Treasury transfer settlement No. 14073, June 5, 1911, credited to appropriation, Survey of northern and northwestern lakes, in payment for cross-section paper furnished (ED 71514-143, Sec. MRC 1156-1212). Includes $89.77 in Treasury settlement No. 14220, June 22, 1911, with St. Louis & San Francisco R. R. Co. for freight transportation (ED 23977-177, Sec. MRC 139-90). Includes $76.08 in Treasury settlement No. 14216, June 20, 1911, with Illinois Central R. R. Co. for freight transportation (ED 8747-1420, Sec. MRC 100-345).

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

SECRETARY, MISSISSIPPI RIVER COMMISSION—continued.

	Appropriation for gauging waters of the Mississippi River and its tributaries.	Expended appropriation.	Grand total.
Amount expended on previous projects			$1,093,358.11
Amount expended on present project to end of last fiscal year	$212,629.76	[1] $22,291.23	7,151,871.79
Balance unexpended at end of last fiscal year	1,984.95		617,677.96
Amount appropriated or allotted since (net)	9,600.00		544,607.25
	11,584.95		1,162,285.21
Amount expended from beginning of present fiscal year to end of previous month	8,277.23		425,245.78
Amount expended during the month	467.48		27,596.78
	8,744.71		452,842.56
Balance unexpended at end of month	[2] 2,294.06		708,896.47
In Treasury United States	600.00		663,681.97
In hand	1,694.06		45,214.50
	2,294.06		708,896.47
Outstanding liabilities at end of month	945.48		38,399.37
Amount covered by existing contracts at end of month	23.42		3,476.44
	968.90		41,875.81
Balance available at end of month	1,325.16		667,020.66

[1] Waterway from Lockport, Ill., to St. Louis, Mo. Unexpended balance of $3,802.17 carried to surplus fund June 30, 1909, under the provisions of section 10 of sundry civil act of Mar. 4, 1909. (ED 46863-142, Sec. MRC 1125-9.)

[2] $546.18 of the unexpended balance for 1910 reverts to the Treasury.

WORKS ABOVE CAIRO.

[Appropriation: Improving Mississippi River.]

	Protection near Cairo.[1]	Des Moines Rapids to Ohio River.	Total.
Amount expended on present project to end of last fiscal year	$50,000.00	$687,632.53	$737,632.53

[1] Includes only work under act of July 5, 1884.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FIRST AND SECOND DISTRICTS.

[Appropriations: Improving Mississippi River; repairing Government levee at Walnut Bend, Ark.; emergencies in river and harbor works; examinations, surveys, and contingencies of rivers and harbors.]

	Improving Mississippi River, allotment for—					
	Surveys.	Upper St. Francis levee district.	Lower St. Francis levee district.	White River levee district.	Reelfoot levee district.	Upper Yazoo levee district.
Amount expended on present project to end of last fiscal year	$140,750.73	$402,623.05	$1,825,786.44	$1,986,578.29	$170,980.45	$1,428,703.45
Balance unexpended at end of last fiscal year	413.13	37,176.95	19,665.54	951.67	9,019.55	....
Amount appropriated or allotted since (net)	[1] 9,698.49	110,000.00	185,000.00	111,138.16	25,000.00	40,000.00
	10,111.62	147,176.95	204,665.54	112,089.83	34,019.55	40,000.00
Amount expended from beginning of present fiscal year to end of previous month	4,164.66	66,046.47	87,190.46	47,019.50	[2] 28,867.09	40,000.00
Amount expended during the month	302.65	13,400.02	12,366.84	9,920.49	88.93	....
	4,467.31	79,446.49	99,557.30	56,939.99	28,956.02	40,000.00
Balance unexpended at end of month	5,644.31	67,730.46	105,108.24	55,149.84	5,063.53	....
In Treasury United States	5,000.00	50,000.00	85,000.00	40,000.00	....	....
In hand	644.31	17,730.46	20,108.24	15,149.84	5,063.53	....
	5,644.31	67,730.46	105,108.24	55,149.84	5,063.53	....
Outstanding liabilities at end of month	100.00	500.00	500.00	3,000.00	....	....
Amount covered by existing contracts at end of month	....	52,000.47	89,770.31	50,448.01	4,140.27	....
	100.00	52,500.47	90,270.31	53,448.01	4,140.27	....
Balance available at end of month	5,544.31	15,229.99	14,837.93	1,701.83	923.26	....

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[1] Amount formerly reported increased 25 cents, being amount received from sale of blue print.

[2] Amount formerly reported reduced $1, being amount refunded on account of overpayment on voucher 57, February, 1911.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FIRST AND SECOND DISTRICTS—continued.

	Improving Mississippi River, allotment for—					
	Plum Point Reach.	Walnut Bend, Ark.	Old Town Bend, Ark.	Repairs to existing works, and stone.	Plant.	New plant.
Amount expended on present project to end of last fiscal year	$5,550,927.10	$221,755.05	$265,200.04	....	$1,458,312.86	....
Balance unexpended at end of last fiscal year	13,329.70	1,644.41	7,718.01	....	2,278.27	....
Amount appropriated or allotted since (net)	....	[1] 123,903.64	[2] 64,374.69	$110,000.00	163,636.50	$380,018.56
	13,329.70	125,548.05	72,092.70	110,000.00	165,914.77	380,018.56
Amount expended from beginning of present fiscal year to end of previous month	1,124.55	121,955.77	64,749.20	3,854.11	97,171.05	37,449.50
Amount expended during the month	....	401.10	240.00	3,231.37	8,443.00	2,666.75
	1,124.55	122,356.87	64,989.20	[3] 7,085.48	105,614.05	40,116.25
Balance unexpended at end of month	12,205.15	3,191.18	7,103.50	102,914.52	60,300.72	339,902.31
In Treasury United States	10,000.00	1,903.64	5,720.97	90,000.00	50,000.00	320,000.00
In hand	2,205.15	1,287.54	1,382.53	12,914.52	10,300.72	19,902.31
	12,205.15	3,191.18	7,103.50	102,914.52	60,300.72	339,902.31
Outstanding liabilities at end of month	....	591.18	103.50	3,000.00	10,000.00	6,000.00
Amount covered by existing contracts at end of month	....	....	....	2,512.29	....	35,600.00
	....	591.18	103.50	5,512.29	10,000.00	41,600.00
Balance available at end of month	12,205.15	2,600.00	7,000.00	97,402.23	50,300.72	298,302.31

[1] Amount formerly reported reduced $1,279.04, being amounts transferred to allotment for dredges and dredging in payment for coal furnished this office. (ED. 1138-11.)

[2] Amount formerly reported reduced $1,279.03, being amounts transferred to allotment for dredges and dredging in payment for coal furnished this office. (ED. 1138-11.)

[3] Amount expended during fiscal year 1911 is chargeable to allotment for Sunflower, Miss.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FIRST AND SECOND DISTRICTS—continued.

	Improving Mississippi River, allotment for—					
	At New Madrid, Mo.	Wolf River.	Hopefield Bend (preservation of works at).	Sunflower, Miss.	Porter Lake, Ark.	Golden Lake, Ark.
Amount expended on present project to end of last fiscal year	$151,297.86	....	$501,577.82	....	....	....
Balance unexpended at end of last fiscal year	1,702.14	....	9,643.28	....	....	....
Amount appropriated or allotted since (net)	....	$10,000.00	[1] 72,976.65	$140,000.00	$105,000.00	$105,000.00
	1,702.14	10,000.00	82,619.93	140,000.00	105,000.00	105,000.00
Amount expended from beginning of present fiscal year to end of previous month	....	2,226.83	45,115.00	....	....	....
Amount expended during the month	....	....	240.00	....	....	....
	....	2,226.83	45,355.00	....	....	....
Balance unexpended at end of month	1,702.14	7,773.17	37,264.93	140,000.00	105,000.00	105,000.00
In Treasury United States	1,320.85	....	33,726.52	140,000.00	105,000.00	105,000.00
In hand	381.29	7,773.17	3,538.41	....	....	....
	1,702.14	7,773.17	37,264.93	140,000.00	105,000.00	105,000.00
Outstanding liabilities at end of month	....	....	264.93	10,000.00	5,000.00	5,000.00
	....	....	264.93	10,000.00	5,000.00	5,000.00
Balance available at end month	1,702.14	7,773.17	37,000.00	130,000.00	100,000.00	100,000.00

[1] Amount formerly reported reduced $1,279.03, being amounts transferred to allotment for dredges and dredging in payment for coal furnished this office. (ED. 1138-11.)

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FIRST AND SECOND DISTRICTS—continued.

	Improving Mississippi River, allotment for—			Expended appropriations.	Grand total.
	General repairs and stone.	Expended allotments.	Total.		
Amount expended on present project to end of last fiscal year	....	[1] $2,590,588.68	$16,695,081.82	[2] $98,485.00	$16,793,566.82
Balance unexpended at end of last fiscal year	....	....	103,542.65	....	103,542.65
Amount appropriated or allotted since (net)	100,000.00	....	1,855,746.72	....	1,855,746.72
	100,000.00	....	1,959,289.37	....	1,959,289.37
Amount expended from beginning of present fiscal year to end of previous month	....	....	646,934.19	....	646,934.19
Amount expended during the month	....	....	51,301.18	....	51,301.18
	....	....	698,235.37	....	698,235.37
Balance unexpended at end of month	100,000.00	....	1,261,054.00	....	1,261,054.00
In Treasury United States	100,000.00	....	1,142,671.98	....	1,142,671.98
In hand	....	....	118,382.02	....	118,382.02
	100,000.00	....	1,261,054.00	....	1,261,054.00
Outstanding liabilities at end of month	....	....	44,059.61	....	44,059.61
Amount covered by existing contracts at end of month	....	....	234,471.35	....	234,471.35
	....	....	278,530.96	....	278,530.96
Balance available at end of month	100,000.00	....	982,523.04	....	982,523.04

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[1] Preservation of works, $54,867.89; Walnut Bend Levee, preservation of works at, $28,200; removal of Nonconnah Rock, $9,000; dredges and dredging, $388,097.12; Columbus, Ky., $43,750; improving St. Francis River (Walnut Bend Levee), $75,000; at Memphis, Tenn., $45,000; improving harbor at Memphis, Tenn., $1,425,038.77; improving harbor at Memphis, Tenn., (Wolf River) $45,000; dikes, $54,924.42; at Memphis, Tenn. (Wolf River), $25,786; at Hickman, Ky., $95,132; at Helena, Ark., $219,000; at Caruthersville, Mo., $80,314.37; chute of Island 26 (abattis dikes), $1,478.11.

[2] Repairing Government levee at Walnut Bend, Ark., $90,000; emergencies in river and harbor works (for Wolf River), $8,000; examinations, surveys, and contingencies of rivers and harbors, $485.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

THIRD DISTRICT.

[Appropriation: Improving Mississippi River.]

	Improving Mississippi River, allotment for—					
	Surveys, gauges, and observations.	Lower Yazoo levee district.	Upper Tensas levee district.	Panther Forest, Ark.	Vaucluse, Ark.	Fitlers Bend.
Amount expended on present project to end of last fiscal year	$131,282.21	$4,428,383.44	$5,605,161.64	$71,307.26	$68,918.82	$97,555.77
Balance unexpended at end of last fiscal year	141.46	85,108.43	63,589.19	....	1,081.18	....
Amount appropriated or allotted since (net)	10,000.00	160,000.00	120,000.00	40,000.00	75,000.00	40,000.00
	10,141.46	245,108.43	183,589.19	40,000.00	76,081.18	40,000.00
Amount expended from beginning of present fiscal year to end of previous month	4,796.37	186,767.90	177,381.98	40,000.00	41,081.18	25,178.46
Amount expended during the month	364.36	2,411.75	5.44	....	....	18.00
	5,160.73	189,179.65	177,387.42	40,000.00	41,081.18	25,196.46
Balance unexpended at end of month	4,980.73	55,928.78	6,201.77	....	35,000.00	14,803.54
In Treasury United States	4,000.00	51,000.00	3,000.00	....	35,000.00	....
In hand	980.73	4,928.78	3,201.77	....	....	14,803.54
	4,980.73	55,928.78	6,201.77	....	35,000.00	14,803.54
Outstanding liabilities at end of month	500.00	700.00	1.77	....	2,500.00	....
Amount covered by existing contracts at end of month	....	27,100.00	6,200.00	....	2,000.00	....
	500.00	27,800.00	6,201.77	....	4,500.00	....
Balance available at end of month	4,480.73	28,128.78	....	....	30,500.00	14,803.54

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

THIRD DISTRICT—continued.

	Improving Mississippi River, allotment for—					
	Albemarle Bend.	Repairs to existing works and stone.	Plant.	Greenville, Miss.	Lake Bolivar front.	Ashbrook Neck.
Amount expended on present project to end of last fiscal year	....	(1)	$1,424,260.82	$1,001,790.21	$289,086.88	$705,127.96
Balance unexpended at end of last fiscal year	....	$60,979.26	98,780.16	....	....	....
Amount appropriated or allotted since (net)	$400,000.00	160,000.00	[2] 419,423.78	40,000.00	70,000.00	35,000.00
	400.000.00	220,979.26	518,203.94	40,000.00	70,000.00	35,000.00
Amount expended from beginning of present fiscal year to end of previous month	400,000.00	135,979.26	141,060.31	11,840.71	....	....
Amount expended during the month	....	9,296.98	14,880.06	....	....	....
	400,000.00	[3] 145,276.24	[4] 157,940.37	11,840.71	....	....
Balance unexpended at end of month	....	75,703.02	362,263.57	28,159.29	70,000.00	35,000.00
In Treasury United States	....	70,000.00	344,077.97	22,000.00	64,000.00	35,000.00
In hand	....	5,703.02	18,185.60	6,159.29	6,000.00	....
	....	75,703.02	362,263.57	28,159.29	70,000.00	35,000.00
Outstanding liabilities at end of month	....	7,000.00	86,500.00	....	5,000.00	2,500.00
Amount covered by existing contracts at end of month	....	....	117,940.00	....	4,000.00	2,000.00
	....	7,000.00	204,440.00	....	9,000.00	4,500.00
Balance available at end of month	....	68,703.02	157,823.57	28,159.29	61,000.00	30,500.00

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[1] Amount expended during the fiscal year 1910 distributed to following works: Upper Tensas levee district (Redfork revetment), $1,093.03; Lake Bolivar front, $3,354.82; Ashbrook Neck, $1,580.19; Panther Forest, Ark., $1,307.26; Leland Neck, Ark., $4.88; Lake Providence Reach, $129.78; Fitlers Bend, $8; Reid-Bedford Bend, $19,404.44; plant, $12,237.63.

[2] Amount previously reported decreased $1,941.22, transfer of funds in Treasury to dredges and dredging, secretary's office, included in expenditures in statement for Apr. 30, 1911. Amount previously reported increased $1,025, reimbursement by transfer of funds in Treasury from new plant, first and second districts, deducted from expenditures in statement for Apr. 30, 1911.

[3] Amount expended during the fiscal year distributed to following works:

Upper Tensas levee district (Redfork revetment)	$2,400.35
Panther Forest	28,369.54
Vaucluse, Ark	7,331.81
Fitlers Bend	1,075.30
Albemarle Bend	11,802.67
Plant, third district	8,912.43
Greenville, Miss	1,485.56
Lake Bolivar front	5,490.01
Ashbrook Neck	2,731.73
Leland Neck, Ark	61,845.84
Grand Lake, Ark	10,926.91
Reid-Bedford Bend	2,815.06
Lake Providence Reach	9.61
Total	145,276.24

[4] Amount previously reported decreased $916.22, to correct error in statement for Apr. 30, 1911, where expenditures for that month were increased $1,941.22, transfer of funds to dredges and dredging, secretary's office, and decreased $1,025, transfer of funds from new plant, first and second districts.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

THIRD DISTRICT—continued.

	Improving Mississippi River, allotment for—				
	Leland Neck, Ark.	Grand Lake, Ark.	Reid-Bedford Bend.	Expended allotments.	Total.
Amount expended on present project to end of last fiscal year.	$105,004.88		$209,452.21	[1] $5,147,082.28	$19,284,414.38
Balance unexpended at end of last fiscal year					309,679.68
Amount appropriated or allotted since (net)	35,000.00	$140,000.00	35,000.00		1,779,423.78
	35,000.00	140,000.00	35,000.00		2,089,103.46
Amount expended from beginning of present fiscal year to end of previous month					1,164,086.17
Amount expended during the month					26,976.59
					1,191,062.76
Balance unexpended at end of month	35,000.00	140,000.00	35,000.00		898,040.70
In Treasury United States	35,000.00	128,000.00	35,000.00		826,077.97
In hand		12,000.00			71,962.73
	35,000.00	140,000.00	35,000.00		898,040.70
Outstanding liabilities at end of month	2,500.00	10,000.00	2,500.00		119,701.77
Amount covered by existing contracts at end of month	2,000.00	8,000.00	2,000.00		171,240.00
	4,500.00	18,000.00	4,500.00		290,941.77
Balance available at end of month	30,500.00	122,000.00	30,500.00		607,098.93

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[1] Improving harbor at Vicksburg, Miss., $442,724.77; Delta Point, La., $186,256.21; Longwood, Miss., $157,010.28; Lake Providence Reach, $3,936,947.95; stone, $424,143.07.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FOURTH DISTRICT.

[Appropriation: Improving Mississippi River; emergencies in river and harbor works.]

	Improving Mississippi River, allotment for—					
	Surveys, gauges, and observations.	Lower Tensas levee district.	Atchafalaya levee district.	Lafourche levee district.	Barataria levee district.	Homochitto levee district.
Amount expended on present project to end of last fiscal year	$130,150.77	$3,669,124.65	$1,670,109.66	$672,551.06	$474,732.87	....
Balance unexpended at end of last fiscal year	....	67,857.90	....	....	....	....
Amount appropriated or allotted since (net)	10,002.50	210,001.25	57,001.50	13,000.00	25,000.50	$3,001.10
	10,002.50	277,859.15	57,001.50	13,000.00	25,000.50	3,001.10
Amount expended from beginning of present fiscal year to end of previous month	4,624.19	184,704.26	15,913.90	6,719.10	16,639.91	2,501.22
Amount expended during the month	264.84	7,119.43	5,334.02	168.17	1,908.80	....
	4,889.03	191,823.69	21,247.92	6,887.27	18,548.71	2,501.22
Balance unexpended at end of month	5,113.47	86,035.46	35,753.58	6,112.73	6,451.79	499.88
In Treasury United States	5,000.00	82,997.50	35,753.58	6,000.00	6,000.00	1.10
In hand	113.47	3,037.96	....	112.73	451.79	498.78
	5,113.47	86,035.46	53,753.58	6,112.73	6,451.79	499.88
Outstanding liabilities at end of month	302.80	288.62	101.68	....	1,036.31	....
Amount covered by existing contracts at end of month	....	58,940.99	31,043.15	....	....	....
	302.80	59,229.61	31,144.83	....	1,036.31	....
Balance available at end of month	4,810.67	26,805.85	4,608.75	6,112.73	5,415.48	499.88

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FOURTH DISTRICT—continued.

	Improving Mississippi River, allotment for—					
	Pontchartrain levee district.	Lake Borgne levee district.	Reid-Bedford Bend.	Hard Times Bend.	Bondurant.	Kempe Bend revetment.
Amount expended on present project to end of last fiscal year	$1,799,261.35	$439,666.33	....	....	$67,000.00	$804,703.01
Balance unexpended at end of last fiscal year	16,573.38	3,528.80	....	....	1,000.00	1,296.99
Amount appropriated or allotted since (net)	50,000.00	23,000.00	$90,000.00	$5,000.00	....	365,000.00
	66,573.38	26.528.80	90,000.00	5,000.00	1,000.00	366,296.99
Amount expended from beginning of present fiscal year to end of previous month	42,799.35	23,265.22	85,661.83	1,802.76	86.35	90,950.55
Amount expended during the month	650.86	186.66	169.00	....	....	11,838.76
	43,450.21	23,451.88	85,830.83	1,802.76	86.35	102,789.31
Balance unexpended at end of month	23,123.17	3,076.92	4,169.17	3,197.24	913.65	263,507.68
In Treasury United States	22,000.00	2,000.00	....	....	....	245,000.00
In hand	1,123.17	1,076.92	4,169.17	3,197.24	913.65	18,507.68
	23,123.17	3,076.92	4,169.17	3,197.24	913.65	263,507.68
Outstanding liabilities at end of month	335.54	121.50	1,390.54	....	....	9,719.51
Amount covered by existing contracts at end of month	....	....	....	....	....	87,619.20
	335.54	121.50	1,390.54	....	....	97,338.71
Balance available at end of month	22,787.63	2,955.42	2,778.63	3,197.24	913.65	166,168.97

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FOURTH DISTRICT—continued.

	Improving Mississippi River, allotment for—					
	Plant.	Natchez and Vidalia Harbors, Miss. and La.	New Orleans Harbor, La.	Atchafalaya and Red Rivers, La.	Expended general allotments.	Expended specific allotments.
Amount expended on present project to end of last fiscal year	$653,693.69	$712,002.10	$558,751.75	$73,608.10	[1]$136,506.99	[2]$2,263,601.30
Balance unexpended at end of last fiscal year	11,116.59			10,058.32		
Amount appropriated or allotted since (net)	[3]349,709.96	249,000.00	375,000.00	25,000.00		
	360,826.55	249,000.00	375,000.00	35,058.32		
Amount expended from beginning of present fiscal year to end of previous month	184,338.75	168,887.06	143,589.49	8,113.07		
Amount expended during the month	23,530.90	1,701.16	3,899.43	[4]2,481.62		
	207,869.65	170,588.22	147,488.92	10,594.69		
Balance unexpended at end of month	152,956.90	78,411.78	227,511.08	24,463.63		
In Treasury United States	137,501.41	65,000.00	220,000.00	22,498.45		
In hand	15,455.49	13,411.78	7,511.08	1,965.18		
	152,956.90	78,411.78	227,511.08	24,463.63		
Outstanding liabilities at end of month	4,979.08	17,176.46	12,982.82	3,054.49		
Amount covered by existing contracts at end of month	27,600.00	23,425.80				
	32,579.08	40,602.26	12,982.82	3,054.49		
Balance available at end of month	120,377.82	37,809.52	214,523.26	21,409.14		

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[1] Preservation of works, $134,000; dredges and dredging, $2,506.99.

[2] Improving harbors at Natchez and Vidalia, Miss. and La., $282,252.04; improving harbor at New Orleans, La., $979,639.86; improving Atchafalaya and Red Rivers, La., $1,001,709.40.

[3] Includes amount received from sale of engineer property, $1,040.

[4] Includes $1.55 paid by Treasury settlement.

Consolidated statement of condition of appropriations and allotments under Mississippi River Commission on June 30, 1911—Continued.

FOURTH DISTRICT—continued.

	Improving Mississippi River, allotment for—			Expended appropriations.	Grand total.
	Plaquemine (La.) revetment.	General repairs and stone.	Total.		
Amount expended on present project to end of last fiscal year.	....	....	$14,125,463.63	[1] $50,000.00	$14,175,463.63
Balance unexpended at end of last fiscal year	....	....	111,431.98	....	111,431.98
Amount appropriated or allotted since (net)	$50,000.00	$25,000.00	1,924,716.81	....	1,924,716.81
	50,000.00	25,000.00	2,036,148.79	....	2,036,148.79
Amount expended from beginning of present fiscal year to end of previous month	....	....	980,597.01	....	980,597.01
Amount expended during the month	23.62	....	59,277.27	....	59,277.27
	23.62	....	1,039,874.28	....	1,039,874.28
Balance unexpended at end of month	49,976.38	25,000.00	996,274.51	....	996,274.51
In Treasury United States	45,000.00	25,000.00	919,752.04	....	919,752.04
In hand	4,976.38	....	76,522.47	....	76,522.47
	49,976.38	25,000.00	996,274.51	....	996,274.51
Outstanding liabilities at end of month	2,768.18	....	54,257.53	....	54,257.53
Amount covered by existing contracts at end of month	....	....	228,629.14	....	228,629.14
	2,768.18	....	282,886.67	....	282,886.67
Balance available at end of month	47,208.20	25,000.00	713,387.84	....	713,387.84

[1] Emergencies in river and harbor works: For Giles Bend, Miss., $40,000; for Old River, $10,000.

LIST OF APPENDIXES ACCOMPANYING THE ANNUAL REPORT OF THE MISSISSIPPI RIVER COMMISSION FOR THE FISCAL YEAR ENDING JUNE 30, 1911.

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APPENDIX I.

REPORT OF LIEUT. COL. CHAS. L. POTTER, CORPS OF ENGINEERS, UNITED STATES ARMY, SECRETARY MISSISSIPPI RIVER COMMISSION.

MISSISSIPPI RIVER COMMISSION,
OFFICE OF THE SECRETARY,
St. Louis, Mo., May 31, 1911.

COLONEL: I have the honor to submit the following report of operations under this office for the year ending May 31, 1911.

The works in charge of the secretary of the Mississippi River Commission have been carried on under allotments made by the commission from appropriations for improving the Mississippi River from Head of the Passes to the mouth of the Ohio River, and under allotment for fiscal year from permanent appropriation provided by section 9 of the river and harbor act approved June 13, 1902, for gauging the waters of the Mississippi River and its principal tributaries. The allotments from the first-named appropriation are as follows:

(1) *Mississippi River Commission.*—Available for salaries, clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission.

(2) *Surveys, gauges, and observations.*—Available for survey of the Mississippi River between the Head of the Passes and its headwaters, for the establishment and maintenance of gauges, for special surveys and examinations, and for the collection and reduction of physical data pertaining to the Mississippi River and for the construction, operation, maintenance, and repair of plant.

(3) *Dredges and dredging.*—Available for the construction, operation, maintenance, and repair of dredging plant for the Mississippi River from Head of the Passes to the mouth of the Ohio River.

The allotment from the permanent appropriation for gauging is available for paying salaries of gauge observers and other expenses incident to maintaining gauges at specified places on the Mississippi River and its tributaries.

MISSISSIPPI RIVER COMMISSION.

The Mississippi River Commission held three sessions during the year as follows:

One hundred and twelfth session, June 23–25, 1910, at St. Louis, Mo.

One hundred and thirteenth session, November 14–23, 1910, and one hundred and fourteenth session, April 12–21, 1911, both on board the U. S. S. *Mississippi*, St. Louis, Mo., to New Orleans, La.

The proceedings of these sessions have been printed and issued.

Plant and outfit.—This consists of the steamer *Mississippi*, which has been in service with the commission as follows: Left West Memphis for the fall inspection trip on November 6 and returned on December 13, 1910; left for the spring inspection trip on April 5 and returned on April 30, 1911. On the return trip from New Orleans in the fall this boat was utilized above Red River Landing for inspecting the regular gauges between that point and Memphis, the party from the wrecked steamer *General Casey* being transferred to her for that purpose. During intervals between trips the *Mississippi* has been cared for at West Memphis, Ark., where ordinary necessary repairs have been made. She was hauled out on the new marine ways in January, 1911, and her hull examined; the bottom plating was found in fair condition. An examination of the inside of hull showed that renewals of some of the framing was necessary, and this work will be done before the next trip.

SURVEYS, GAUGES, AND OBSERVATIONS.

General Survey of the Mississippi River.—This survey, authorized by the law creating the Mississippi River Commission, to extend from the Head of Passes near its mouth to its headwaters, has been made with a view of obtaining accurate data for topographic and hydrographic maps for use in study of the river in planning improvements, and as a basis of comparison with future surveys. The field work comprising secondary triangulation, precise levels, topography, and hydrography has been completed over the entire river, a distance of about 2,446 miles. The precise levels also extend down to the jetties at South Pass, an additional distance of about 12 miles. Detailed accounts of this general survey will be found in the various annual reports of the commission, published in the annual reports of the Chief of Engineers, United States Army. An index, in two volumes, printed by the commission contains full references to contents of these reports to June 30, 1909.

Resurveys.—In order to ascertain what changes have occurred in the river below Cairo since the first general survey, the river has been resurveyed between its high-water banks as follows: From Cairo to mouth of Arkansas River, 1902–1904; from Arkansas River to New Orleans, 1894–1898; and from Forts St. Philip and Jackson, La., to the Head of Passes in 1903–4. The results of the comparisons of these surveys below the mouth of Arkansas River have been published in previous reports of the commission; the results of comparison of the cross-section elements of the surveys from Cairo to the mouth of the Arkansas River, comprising various tables and plates, and a report thereon, have been completed during the year.

Permanent marks.—Since the first general survey of the river a large number of the survey marks which were intended to be permanent have been disturbed or destroyed, and many of them have caved into the river.

The systematic work of restoring and relocating old marks and establishing new ones was begun at Cairo in the fall of 1905 and was completed to Donaldsonville, La., 885 miles below Cairo, in January, 1910, work being prosecuted during each low-water season. The reduction of the field notes of this work has been completed in the office.

Preparations are now being made to begin a topographic and hydrographic resurvey of the river below Cairo, based on the reestablished survey marks referred to above.

Precise levels.—On account of discrepancies in the precise levels of earlier years it was necessary to rerun the whole line from the Gulf to Cairo, as stated in previous reports; the last stretch of this line, from Cairo to Memphis, was rerun during the past season. As each stretch of the releveling has been completed the elevations of all bench marks in that stretch have been determined with reference to mean Gulf level, and when the office reduction of the last season's work is completed, it will be possible for the first time to reliably refer all elevations to mean Gulf level, as originally contemplated by the commission.

The precise leveling from Cairo to Memphis was done by a party in charge of Assistant Engineer E. L. Harman, organized on the quarter boat *Illinois* and comprised three single precise level parties, two of these for main line and one for side lines. The party was composed of the following: Assistant Engineer E. L. Harman, chief of party and observer; Assistant Engineer George H. Wolbrecht, observer; Junior Engineer Walter P. Stewart, observer of side-line party; Surveyors C. W. Schweizer, O. W. Harrah, Harry A. Hickman, acting recorders; Surveyor J. G. Vogt, jr., clerk and steward; also foreman, operator of launch, watchman, rodmen, umbrella men, boatmen, axmen, cook and helper, and waiters, a total of 27 persons.

A small gasoline boat, the *Metric*, of less than 10 horsepower, was used to assist in moving the quarter boat down the river and in towing the skiffs to and from work. This boat was rather light for moving the quarter boat and another gasoline boat of about 15 horsepower was hired to assist in the work.

The work began at Cairo, Ill., on September 15, 1910, and was closed at Memphis, Tenn., 230 miles below Cairo, on December 21; 213.55 miles of main line and 61.55 miles of side line, a total of 275.1 miles of levels were run; 135 old bench marks were connected with, and 9 new bench marks were established. Eleven river crossings were made.

The total field cost was $8,134.89, cost per mile of levels $29.57, cost per mile of river $35.37.

The office computation of this work is now nearly completed.

Survey in vicinity of Old, Red, and Atchafalaya Rivers.—This survey was made during the year, as directed by resolution of the commission of June 25, 1910, which was passed pursuant to act of Congress approved June 25, 1910, requiring investigations as to the necessity, urgency, and practicability of permanently separating the waters of the Red and Atchafalaya Rivers from those of the Mississippi River.

A party for this work was organized early in October, 1910, and left Memphis, Tenn., October 11, on the U. S. S. *Patrol*, with a fuel barge and a pile driver in tow.

The party consisted of Asst. Engineer A. T. Morrow, chief of party, Junior Engineer E. J. Thomas, Surveyors F. A. Walton, E. B. Nettleton, Harry B.

Andress, Recorders N. R. Sutton, D. W. Bingham, C. H. Williams, Edwin McKee, 1 foreman, 4 survey men, 9 axmen, and boat's crew of 10 men, including pilot, steam engineer, stoker, deck hands, cooks, and waiters. On October 23 Asst. Engineer Morrow was furloughed on account of ill health and Junior Engineer E. J. Thomas (later assistant engineer) was placed in charge. On December 28 Thomas F. Welsh, overseer, and Fred Knak, foreman for boring work, joined the party at Old River. The field work of the survey was begun on October 18 at Union Point Landing, 742 miles below Cairo, and was completed by the end of February, 1911. The borings were begun on December 27 and were completed on February 15, 1911.

On January 17 a large part of the survey party was disbanded, sufficient force being retained to continue the borings and later to make the reconnoissance survey. All field work was completed by February 28, 1911, and the steamer *Patrol*, towing the pile driver and a barge containing the salvage from the *General Casey*, returned to West Memphis, Ark., and was laid up on March 17, 1911.

The following is the work of this party in detail:

A survey was made of the Mississippi River between the high-water banks from near Union Point Landing for a distance of about 7 miles downstream, the river cross sections for the first 5 miles were about 750 feet apart and for the last 2 miles about 250 feet apart. The topography of the right bank, back to the levee, was developed by sections about 500 meters apart; the survey was extended to include all the cleared land along Grand Cut-off Bayou to Red River, a distance of about 6 miles, and to include cleared land back of the levee from Grand Cut-off Bayou to a point 2 miles below Black Hawk Landing, a distance of 5 miles.

One section was run through the timber from the Mississippi River near Black Hawk Landing to the Red River, a distance of 4 miles. This survey was made with a view to ascertaining the practicability of constructing a navigable waterway connecting the two rivers in this vicinity.

A survey was made of the Mississippi River between the high-water banks for a distance of 5 miles above and 5 miles below the mouth of Old River. River cross sections were sounded about 250 feet apart. The topography of the right bank from Point Breeze to Old River was developed extending back about 800 meters from the high-water bank by section lines at intervals of about 500 meters; near Old River the sections were at intervals of 250 meters and extended from the Mississippi River to Turnbull Island; these were supplemented with sections normal to Old River and extending from Old River to Carr's field at intervals of about 100 meters.

A survey was made of Old River between the high-water banks from the Mississippi River to head of the Atchafalaya, and of the Atchafalaya from the head to about one-half mile below Simmesport. The river cross sections in the Old River from the Mississippi River to Turnbull Island were about 100 feet apart, and from that to head of Atchafalaya River averaged about 300 feet apart. The river cross sections in the Atchafalaya River were at intervals of about 325 feet. In most cases these river cross sections were coincident with those of previous surveys.

The topography on the Torras side of Old River, between Old River and the levee, from the Mississippi River to the Texas & Pacific Railroad, was developed by sections at intervals of 100 meters. West of this railroad the sections were run from the present bank of Old River to the high-water banks as they were prior to the Shreves Cut-off at intervals of about 200 meters.

Borings were made in Old River between the Mississippi River and Turnbull Island and extending above foot of Turnbull Island toward the bridge, and in upper Old River near the foot of Turnbull Island. Twenty borings in all were made, the greatest depth reached was about 115 feet below mean Gulf level. A gravel stratum was developed at depths varying from 45 to 105 feet below mean Gulf level. About 184 samples of these borings were secured and have been brought to the office for arrangement and analysis.

A general reconnoissance was made of the lower part of the Tensas Basin, extending up along the Red and Ouachita Rivers, and the limits of overflow from the Mississippi River approximately defined.

Discharge sections were established for the purpose of observing the flood discharge at stages over 40 feet on the Red River Landing gauge. The stage at Red River landing at the close of the work was only about 32 feet, and therefore no discharges were measured at that time. Discharge stations established were as follows: On the Mississippi River, above and below the mouth of Old

River; on Old River, on the Atchafalaya River near Simmesport; on the Red River, above and below the mouth of Black River.

These stations, with an additional one on the Black River, were occupied by discharge parties during the recent high water; this work is described under head of discharge observations.

The field notes are being reduced and platted in the office in charge of Asst. Engineer E. J. Thomas. The river cross sections of this and previous surveys are being drawn on the same sheets for comparison. The reduction and platting is about 50 per cent completed.

Reduction and platting of the general survey.—The reduction of the field notes of a short strip of survey just below Lake Itasca was finished. This completes the reduction and platting of all field notes of the general survey.

Mapping.—Detail charts of the Mississippi River above Minneapolis, Minn., scale 1:5,000. This series is numbered from 201 to 278, and is published to a scale of 1:10,000 to include No. 261. The drawing of charts 262 to 268 is nearly completed, and charts Nos. 270, 274, 275, 278 are in various stages of completion.

Inch-to-mile maps.—These have been published in 77 sheets, covering the river from the Gulf to Grand Rapids, Minn. These sheets are numbered from 1 to 32 below Cairo, and 101 to 145 above Cairo. Sheet No. 146 is complete, ready for publication, and sheet No. 147 is about 50 per cent complete. Three more sheets, which complete this series to Lake Itasca, have been pantographed.

The office force in the drawing division during the year consisted of Messrs. K. A. Widen, H. A. H. d'Ailly, C. R. Appiano, and Paul Burgoldt, draftsmen. Mr. Charles W. Clark, assistant engineer, was in charge of this division until his death, which occurred after a brief illness on March 12, 1911.

Published maps and charts.—Detail charts Nos. 252 to 261, scale 1:10,000, were published during the year, this series begins at Minneapolis with chart No. 201; chart 261 extends to the upper end of Lake Winnibigoshish.

A descriptive list of maps and charts previously published by the commission will be found on page 2958 of report of the Chief of Engineers for 1910.

Gauges.—The gauges in charge of this office comprise 38 regular gauges on the Mississippi River and its principal tributaries, 185 special high-water gauges, and 2 self-registering tide gauges on the Gulf of Mexico. A detailed description of these gauges will be found in the supplement to report of the Chief of Engineers, United States Army, for 1902, pages 52 to 59.

The high-water gauge inspections which were in progress on May 31, 1910, were completed by June 29, 1910. The old gauge bulletin at Cairo, Ill., was replaced with one of the new type on June 22, 1910.

All of the regular gauges, with the exception of those at Louisville, Ky., were inspected during the low-water season of 1910. The high-water inspection of all gauges below Memphis is still in progress. The following is the work in detail.

The low-water inspection of the regular gauges from Memphis to Fort Jackson, La., the Barbre Landing gauge, and the tide gauge at East Bay, La., was made by a party on the U. S. S. *General T. L. Casey*, in charge of Junior Engineer T. B. Perry. Both the hull and boilers of this boat were in poor condition. Several days were lost making repairs at Algiers, La., and at Baton Rouge, La. While entering Old River on November 15, on the return trip, the boat ran on a hidden obstruction and sank in about 4 feet of water. On account of the shallow depth, the movable property was transferred without loss to the U. S. S. *Patrol*, which was in that vicinity at the time. The boilers and machinery of the *General Casey* were transferred by the U. S. snagboat *Macomb* to a decked barge borrowed from the fourth district office. Later this barge and the salvage from the wreck was brought by the *Patrol* to West Memphis, Ark. As the hull of the *General Casey* showed signs of breaking up and was forming an obstruction to navigation in Old River, the cabin was burned off and the hull was dynamited upon recommendation of an inspector appointed by the War Department. The gauge inspection party was transferred to the U. S. S. *Mississippi*, which was returning to West Memphis after the commission trip, on November 29, and inspected all regular gauges on the trip up. The boat reached West Memphis on December 13, 1910. The inspection of the regular gauges above Memphis was made by Junior Engineer Perry traveling by the dredge survey boats as opportunity offered and by rail. The low-water inspection of all the regular gauges below St. Louis was completed at Cape Girardeau, Mo., on December 22, 1910.

The low-water inspection of the regular gauges on the tributaries was made as follows: At Little Rock, Ark.; Fulton, Ark.; Shreveport, La.; Alexandria, La.; Nashville, Tenn.; and the tide gauge at Biloxi, by Asst. Engineer Kivas Tully, from November 17 to 26. At Clarendon, Ark.; Florence, Ala.; the St. Francis River gauge; and Jacksonport, Ark., by Surveyor Robert A. Brown, from December 14 to 18, 1910.

The steel concrete gauge at St. Louis, Mo., was extended down from 5 feet above zero to zero during the protracted low water of November and temporary graduations were cut in the concrete to 2.8 feet.

At the low-water inspection all of the gauge sections were tested by duplicate lines of ordinary levels from the permanent bench marks at the respective stations. The gauges and bulletins were repaired and repainted where necessary and all left in good condition.

The high-water inspection of the Louisville, Ky., gauges was made by Asst. Engineer Kivas Tully on February 15, 1911. The regular and high-water gauges from Cairo to Memphis were inspected by Surveyor Robert A. Brown on the steamer *Venus* from April 27 to May 9, 1911. The high-water inspection of all gauges on the main river below Memphis is now in progress.

All high-water gauge observers from Cairo to Head of the Passes were notified to record the recent high water; reports from a large proportion of these observers have been received.

Five new steel bulletins for displaying the gauge readings to passing boats were made under contract by the Henry Vogt Machine Co., of Louisville, Ky., and delivered at West Memphis on April 4, 1911.

The gauge readings have been tabulated and platted in the office as received from the observers and corrections applied for any errors in the gauges determined from level notes of the inspections.

The hourly ordinates of the tide gauges at Biloxi, Miss., and East Bay, La., have been scaled off and tabulated to October, 1910.

The annual hydrographs of the Mississippi River and tributaries for 1910 are being prepared in four sheets for blue printing. The hydrographs of all regular gauges on the Mississippi River from Cairo, Ill., to Fort Jackson, La., June 1, 1910, to May 31, 1911, are given on plate 1.

The annual pamphlet of river stages for 1910 is now in preparation.

The highest and lowest gauge readings of 1910 for stations on the Mississippi River and tributaries, with extreme readings prior to 1910, are given in Table 1 herewith.

Discharge observations.—During the low-water season of 1910 a series of discharge measurements was made at Carrollton, La., by a party in charge of Surveyor F. E. Early.

The gasoline launch *Beatrice* was loaned by the fourth district for use of this party. Observations were begun on December 7 and continued until December 19, 1910. The meters were then rated and the party returned to St. Louis. Eighteen discharge measurements were obtained; the results have been computed in the office.

This was the only series of discharge observations made during the low-water season, as at no other station did the river reach the low-water stage prescribed for this work.

During the present high-water season discharge observations have been made on the Tennessee River at Riverton, Ala., and on the Mississippi River at Columbus, Ky., Chicot. Ark., and Carrollton, La.; also a series at selected stations in the vicinity of mouth of Red River, specially ordered in connection with proposed separation of the waters of the Red and Mississippi Rivers.

The observations on the Tennessee were made by a party in charge of Junior Engineer T. B. Perry, from April 12 to 18, on the gasoline boat *White Oak*, borrowed from the United States engineer office at Nashville. These are the first discharge observations on the Tennessee River taken by this office since the low water of 1908.

The observations at Columbus, Ky., were made by a party on the U. S. S. *Venus* in charge of Surveyor E. E. Whitehead from April 24 to 26.

The observations at Chicot. Ark., were made by a party on the U. S. S. *Mercury* in charge of Surveyor E. E. Whitehead from April 26 to May 5. Mr. Whitehead relinquished charge to Surveyor E. B. Nettleton on May 2 and went to Carrollton.

Observations at Carrollton were made by a party in charge of Surveyor E. E. Whitehead on the U. S. S. *Teche*, loaned by the fourth district office.

HYDROGRAPHS OF THE MISSISSIPPI

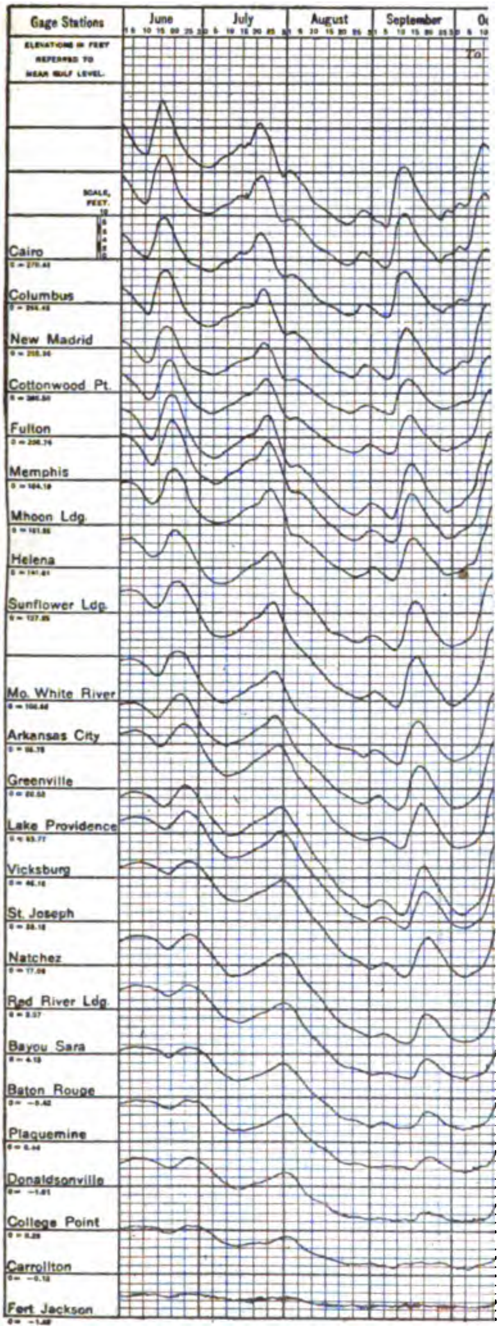

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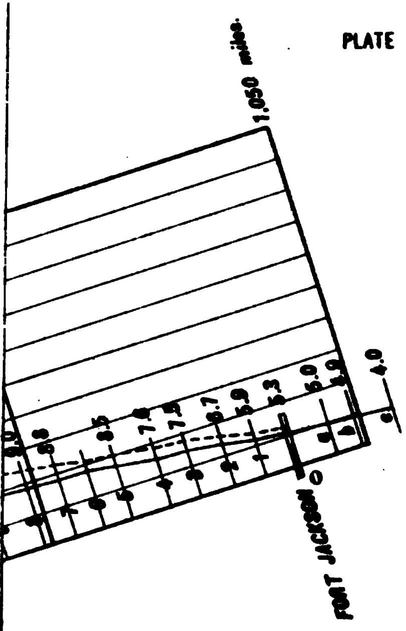
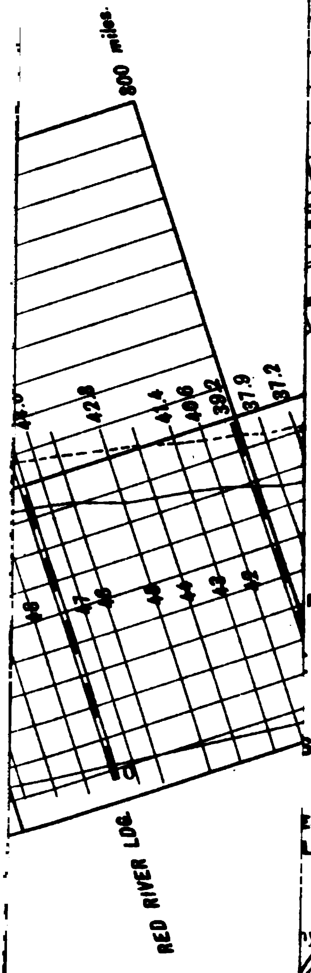
PLATE 2





PPI RIVER COMMISSION.

OF HIGH WATER

OF 1911

SISSIPPI RIVER

TO HEAD OF PASSES, LA.

ES OF HIGH WATER OF 1903

LOW WATER OF 1901.

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ny my annual report for 1911.

has. L. Potter

Col., Corps of Engineers, U. S. Army,

cretary Mississippi River Commission.

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Sheet 2

PRINTED BY THE U.S. GEOLOGICAL SURVEY

House Doc. 129; 62d Cong. 2d Sess.

Observations were begun at Carrollton on May 8 and continued until May 21, 1911.

The observations in vicinity of mouth of Red River have been in charge of Junior Engineer T. B. Perry on the U. S. S. *Search*, assisted by two subparties on the steamers *Mars* and *Mercury*, the latter joining the party after work at Chicot was concluded. The steamers *Search* and *Mars* reached mouth of Old River on April 28, and observations were begun. Discharges have been measured at the following places: On the Mississippi River, at Point Breeze, La., and at Red River Landing, La.; on Old River, below Turnbull Island; on Atchafalaya River, one-half mile below Simmesport, La.; on Red River, above and below the mouth of Black River; on Black River, 2 miles above its mouth.

On the conclusion of these observations the parties began the high-water inspection of gauges below Memphis.

The scientific records, maps, and construction drawings of the secretary's office have been catalogued as received and the card indexes written up. A large number of requests for data of the Mississippi River have been complied with.

The index to the annual reports of the commission from 1896 to 1909, which has been in preparation for some time, was completed and printed. This is intended to be an encyclopedic index and contains about 120 pages.

The following gentlemen have been engaged in the office work of this division during the year when not on field duty: Asst. Engineer E. J. Thomas (to October, 1910), Junior Engineer T. B. Perry, Surveyors F. E. Early, E. E. Whitehead, R. A. Brown, C. W. Schweizer. Mr. W. W. Primm, surveyor, was also engaged in this division until his death, which occurred on January 13, 1911.

Asst. Engineer Kivas Tully has continued in charge of this division.

Plant.—At the beginning of the year the plant pertaining to surveys, gauges, and observations consisted of the steamers *Patrol* and *General T. L. Casey*, the quarter boat *Illinois*, and a number of skiffs. In September a small gasoline boat, the *Metric*, was purchased. As reported under gauge inspection, the steamer *General Casey* was sunk in Old River on November 15, 1910, and proved a total loss, with the exception of boilers and machinery, which are now at the dredge depot.

All this plant when not in service has been cared for at the dredge fleet at West Memphis, Ark.

The steamer *Patrol* is now undergoing extensive repairs to her hull to fit her for service the coming season.

The expenses of care and repairs to this plant are borne by the allotment for surveys, gauges, and observations.

Plans are being prepared for a new boat for gauge inspection and discharge work.

DREDGES AND DREDGING.

Project.—On June 20, 1896, the Mississippi River Commission adopted a project for obtaining and maintaining, by means of dredges, a channel in the Mississippi River below Cairo, with a width of 250 feet and a depth of at least 9 feet throughout the year, except when the river is closed by ice. The commission in 1891 took under consideration the question of construction of dredging devices to be operated with a view to obtaining temporary relief for low-water navigation and experimented along these lines between 1891 and 1896. Up to the present time 10 hydraulic dredging plants have been constructed, 9 of which are still serviceable. Detailed reports of work for each year will be found in the annual reports of the Mississippi River Commission, beginning with that of 1892.

PLANT.

The floating plant pertaining to dredges and dredging consists of the following: Dredges (*Beta*, *Gamma*, *Delta*, *Epsilon*, *Zeta*, *Iota*, *Kappa*, *Henry Flad*, and *B. M. Harrod*), 9; steamboats (*Sachem*, *Choctaw*, *Leota*, *Nokomis*, *Wynoka*, *Search*, *Venus*, *Vulcan*, *Mercury*, and *Mars*), 10; pile sinkers (*Nos. 13*, *971*, *981*, *982*, and *983*), 5; barges (*Nos. 041* and *051*), 2; pump boats, 1; calking flats, 2; sectional dock, sections, 6. Also a number of skiffs and small motor boats.

The small tenders *Venus*, *Vulcan*, *Mercury*, and *Mars* were used at different times as fleet tenders during the lay-up season.

On August 2, 1910, the steamer *Search* was dispatched to Friars Point to report conditions of the channel between that point and Memphis to the commanding officer of the monitor *Amphitrite*. She returned on August 4.

The steamers *Nokomis* and *Leota* left the fleet about 3.30 p. m. on August 5 for White Hall, Ark., upon telephone request from Lieut. Johnson, of the *Amphitrite*, that two boats be sent to tow his ship to Memphis, as she was entirely disabled, and repairs could not be made at that point. The steamers with the *Amphitrite* in tow arrived at Memphis about 6 p. m. on August 6.

The steamer *Choctaw* on October 20 was sent to the assistance of the Lee Line steamer *James Lee*, ashore at the head of Josie Harry Chute.

The steamer *Venus* left the fleet for Columbus, Ky., April 21 for high-water discharge and gauge-inspection work and returned on May 9.

The steamers *Search*, *Mercury*, and *Mars* left the fleet late in April for service in high-water discharge and gauge-inspection work, and are still in the field.

Marine railway dry dock.—This is a dry dock of the side-haul railway type as described in previous reports. The dock has been constructed on land owned by the United States at West Memphis, Ark., and was completed by the contractor on December 20, 1910, and has since been tested under working conditions. The results were generally satisfactory, but it was found that no means had been provided for equalizing the strains on the different chains. The contractor proposes to overcome this difficulty by putting in brakes. On April 11, while hauling the dredge *Delta* up to near the head of the ways, the worm gear at cradle No. 3 broke. The worm-gear bearings were also broken and the sprocket-shaft pillow block was cracked. New parts were immediately ordered and are being made.

A frame shed and engine house, with corrugated-steel roof, is being constructed at the upper end of the ways. The compartments inclosing the machinery are made with tight walls to exclude the dust from the sand blast.

The operations of this dock to date are stated further on in this report.

SUBSISTENCE.

All employees were furnished subsistence in kind. During the year 93,313 rations were served at a cost of $0.6065 each, including the wages of cooks, waiters, and all necessary labor in caring for quarters.

COAL.

Thirty-four barges of coal, containing 512,605 bushels, were purchased during the year. Twenty of these barges were delivered at the coal harbor above Caruthersville, Mo., 13 at the dredge depot, and 1 to dredge *Epsilon* at Vicksburg, Miss. In addition to these 34 barges, 1,493 bushels were purchased in open market by boats en route.

The coal delivered at the coal harbor was cared for there and delivered to the dredges in that stretch of the river as required. At the close of dredging operations all barges remaining at the coal harbor were moved to the dredge depot at West Memphis, Ark.

Bids have been opened for furnishing 580,000 bushels of coal for use during the coming season.

REPAIRS TO PLANT.

In addition to the repairs stated in the following paragraphs there has been done a great amount of work incident to the care of a large fleet and its maintenance in a high degree of efficiency. This includes cleaning and scaling boilers, testing boilers, renewing decayed wood of decks and cabins, repairs to pipe work, cleaning holds of boats, painting, general minor repairs to hulls and machinery, and laying up the boats after the field season. In the shops an increasing amount of repair work has been done and numerous tools have been made and repaired for use of the fleet.

An itemized statement of the cost of repairs will be found in Table 3, accompanying this report.

Dredge "Beta."—Repairs to suction head were completed. Alterations to the winding engines and installation of new gear wheels were completed. The boilers were drilled and tested and some tubes were renewed. Some of the *Gamma's* old pontoons were repaired to replace some of the *Beta's* which were unserviceable. New cables were wound on the drums. Some repairs were made to the feed pumps, pipe lines, cabin, and dynamo.

Dredge "Gamma."—The installation of the new discharge pipe and suction pipe, alterations to the suction head, the assembling and fitting up of the machinery, rewiring of the lighting system, installation of the stern connection for the floating discharge pipe, and reconstruction of the old suction head were completed. The new discharge pipe was placed on the pontoons. The new suction head was installed. A new valve seat was made for the high-pressure cylinder. Some holes were drilled in the discharge pipe for use in determining the distribution of sand. The new drag suction head was installed on the dredge. The new worms and wheels of the winding engines were installed. The head block was removed to render possible the raising of the drag suction head entirely above water, and on January 11 the dredge was moved out on the bar opposite the dredge depot for the purpose of testing the suction head. These tests were continued through the 13th, when the dredge was moved into the fleet and laid up.

The dredge was docked in March and the outside of the hull sand-blasted and coated with gas-house pitch. New strainers for the boiler feed pump and jet pump were made and riveted to the hull.

Dredge "Delta."—New breechings were constructed and installed. Repairs to the suction head were completed. Installation of the new boiler feed pump was completed. The elbows of the suction pipe were examined and leaks repaired. New asbestos roofing was laid. Boat was painted outside. New water tanks were erected. This dredge was docked in April and the hull sand-blasted and coated with gas-house pitch. The radial joints of the suction pipe and sea valves were repaired.

Dredge "Epsilon."—The stacks were wired and electric signal lights installed. A new water tank was made for the roof. Some repairs were made to the suction head, pontoon couplings, and gears of the winding engines, and to the electric-light engine. The auxiliary steam line was removed from the hold to the engine and boiler rooms. New casing liners are being prepared in the shop for fitting in the pump. The boilers were drilled for determination of the thickness of the shells. The hub of the pump runner was cracked by the freezing of an accumulation of water in the core immediately after being withdrawn from service and a new runner will be required. The cracked runner was removed from the shaft.

Dredge "Zeta."—The cables from the *Henry Flad* were reeled on the winding drums. A hot-water tank was constructed and installed. A governor arm for the main pumping engine was machined. The discharge pipe in the hold was patched. New plungers were made for the boiler-feed pumps. The window and door openings are being screened.

Dredge "Iota."—The pontoons and discharge pipe were extensively repaired. A new tank was constructed for the water-supply system. Some holes were drilled in the boilers to determine the thickness of the shells. The old wooden wheelhouses were removed, and the work of erecting new steel ones was commenced. New liners were fitted in the main pump. The electric-wiring system was extensively repaired.

Dredge "Kappa."—The flame bed was renewed. Some brass gaskets were made for the cylinder heads of the propelling engines to increase the clearance. The erection of the splash bulkheads of the wheelhouses was completed. While dredging in the chute of Island No. 30 crossing, on August 14, the hubs and follower head of both water pistons of the air pump were broken. Repairs were made. A nipple was made for the home section of the discharge pipe. The starboard boiler was patched. While lying at the bank at Luxora a slight bag in one of the boilers was set up, and the furnaces were repaired. The discharge pipe in the hold was turned over and repaired. New liners were fitted in the main-pump casing. A new hot-water tank was made for the water-supply system and installed. New wearing rings were made for the throat liners of the main pump. The bottoms of the suction pipes are being lined with new steel plates. The door, window, and skylight openings are being screened.

Dredge "Henry Flad."—Some brass gaskets were made for the propelling engine cylinder heads to increase the clearance. Erection of the splash bulkheads in the wheelhouses was completed. New forward cylinder heads are being made for the propelling engines, the old ones being cracked. The *Beta's* old cables were installed on the winding drums. This dredge was docked in February, and the outside of the hull was cleaned and painted with gas-house pitch. The discharge pipe in the hold was patched. Some new brasses were fitted in the propelling engines, and a new cast-iron pedestal was made for the valve rigging of the propelling engines.

Dredge "B. M. Harrod."—While taking in the slack on the port cable while lying at the bank at Point Pleasant, September 16, the piston head of the winding engine was broken. This was repaired. The lining of the main pump was renewed. The throat rings of the main pumps were repaired. The separator for the auxiliary steam line was moved from the main deck into the forward hold.

Steamer "Sachem."—New crank pin brasses were procured and machined. Some alterations were made in the pipes of the water-supply system. The cold-storage box was rebuilt. The window and door openings were screened.

Steamer "Choctaw."—The fantails and water system were repaired, the stack knees were erected, and a new throttle-valve chamber was procured, machined, and installed. The cold-storage box was rebuilt. New crank-pin brasses were cast for the propelling engines. The outside of cabin was painted.

Steamer "Leota."—The dynamo was repaired. New stacks were erected. The cold-storage box was rebuilt. The splash bulkhead was rebuilt. One of the rudders was repaired.

Steamer "Nokomis."—The electric-light engine was repaired. A water tank was made for the water-supply system. New stacks were erected and painted. Small bags in two of the boilers were set up. The cold-storage box was rebuilt. One of the rudders was repaired and new one installed.

Steamer "Wynoka."—The wheel, fantails, and dynamo were repaired. Some repairs were made to the lighting system. New smokestacks and pumps were erected.

Steamer "Search."—The foundation under the capstan engine was renewed. The cabin was painted. Some stay braces were renewed in the boilers. Holes were drilled in the boilers for testing. The armature and commutator of the dynamo were repaired. New cam yokes were made and installed. A hot-water tank was constructed for the roof, and a steam-pipe coil was installed in the tank. The deck and outriggers were extensively repaired.

Steamer "Venus."—A new smokestack was made and erected. Repairs to the deck, cabin, and propelling engines were completed. Painting was completed. A new pillow block was made, machined, and installed under one of the main shaft bearings. One of the rudders was repaired. The ice box was rebuilt. A new crosshead was made for one of the propelling engines. The splash bulkhead was renewed.

Steamer "Vulcan."—A new smokestack and breeching were made and erected. The outside of the boat was painted. A fire pump for fleet protection was installed. New pillow blocks were procured, machined, and installed.

Steamer "Mercury."—Some flues were fitted in the boiler and other repairs made. A fire pump for fleet protection was installed on this boat. Some brasses were cast for the propelling engines. The capstan-engine crossheads and journal brasses were machined. A journal cap was forged.

Steamer "Mars."—The construction of the new ice box was completed. Extensive repairs were made to the main deck. The fantails, breeching, rudders, and feed pumps were repaired. A new sheet was riveted in the boiler and some flues renewed. A new mud drum and ash pan were constructed.

Pile sinker "No. 13."—The furnace was repaired. Minor repairs were made to the jet pump, furnace, main steam and siphon lines.

Pile sinker "No. 971."—The feed pump, boiler, and furnace were repaired and the machinery generally overhauled.

Pile sinker "No. 981."—The deck and cabin were repaired, and the cabin and leads were painted. The hoisting engine and feed pump were repaired. A wooden derrick was installed on this pile sinker. The boiler was patched.

Pile sinker "No. 982."—Repairs to the leads, deck, and hull were made and cabin was painted. A new stack was constructed, and the boiler and jet pump were repaired.

Pile sinker "No. 983."—The cabin, feed pump, and leads were repaired. This pile sinker was docked, and some repairs were made to the hull.

Pump boat.—This boat was docked on January 16, and extensive repairs were made to the gunwales. The sides were calked, the cabin and hull were painted, and the deck and deck pump were repaired.

Sectional dock.—Some minor repairs were made, and the sides were calked.

Barge "No. 041."—The hull was calked and repaired.

Barge "No. 051."—The hull was repaired.

Motor boats.—A new gasoline tank and a cooling pump were made for one of these boats.

Skiffs.—Some skiffs were repaired.

Buoys.—Sheet-iron buoys were constructed for use in marking dredged channels in the low-water season.

Testing.—Oil and rope samples were tested. The relative holding power of stock and stockless anchors was tested.

Tools and appliances.—A car for yard railway and a new boring bar were constructed. A saw swage was installed in the woodworking shop. Some clamps were made for the blacksmith shop, and one of the forges was repaired. New gears were fitted in the radial drill. Patterns were made for cast-iron kevels to replace all wooden ones. Some air tools were made for the boiler shop, and some nozzles were made. The air compressor for the sand-blast outfit was repaired and erected in the carpenter shop. Hooks of a special design were forged for pile tackle blocks. The sand-blast hopper, some tackle blocks, and one of the pneumatic hammers were repaired.

Building and grounds.—With the purchase of land and the erection of the marine ways at West Memphis, Ark., the establishment of the dredge depot at this point may be regarded as permanent. The present shop buildings, however, which are mostly of a temporary character, are quite inadequate to the increasing demands of the fleet. Plans have therefore been prepared for a reenforced concrete building to afford shop room for the various branches of the work. Plans have also been prepared for an office building having a fireproof vault for storing the records of the fleet. It is the intention to have these buildings constructed this summer.

The following work has been done on this property during the year:

The boiler feed and water supply pumps were repaired. An awning was erected for the protection of the iron workers on smokestack construction. Parts of the suction pipe to the artesian well were renewed. The boilers of the steam plant were tested and some flanges were faced and drilled. The winding engine of the incline tramway was repaired. A ventilator was placed in the roof of the boiler shop. The belts in the woodworking shop and the roof were repaired. Doors were made for the boiler shop and a stove was installed. The water pipes and valves were boxed to prevent freezing. Some steel plating was removed from the hull of the *Alpha* for stock. The grade of the yard railway was raised. Cinder paths were made through the yard. A small levee was built to prevent high water from carrying drift over the marine ways. A foundation was built for track scales and the scales were erected. An extension to the yard railway was constructed.

Marine railway dry dock.—Repairs: Minor repairs were made to the engines and some clamps were forged. Temporary covers were made for gearing and hauling machinery. The sand-blasting outfit was set up and prepared for service. The worm gear wheel which was broken on April 11 was removed from the shaft and a gauge was made for boring the new wheel. The broken wheels on the cradles were renewed.

Operations: The pump boat was docked from January 16 to 18. The steamer *Mississippi* was docked from January 18 to 20. The dredge of the Union Sand & Material Co. was docked from January 20 to 25. Pile sinker *No. 983* was docked from January 20 to 25. The snag boat *Reese*, Little Rock engineer district, was docked from January 26 to February 9. The dredge *Henry Flad* was docked from February 9 to March 17. The dredge *Gamma* was docked from March 17 to April 1. The dredge *Delta* was docked on April 3 and 4, raised out of the reach of high water on the 11th, and was put back in the water on May 20.

DREDGING OPERATIONS ON THE MISSISSIPPI RIVER BETWEEN CAIRO, ILL., AND THE HEAD OF THE PASSES.

Full accounts of each season's dredging work will be found in the annual reports of this office for 1896 to 1909.

During the low-water season of 1910 seven dredges, the *Gamma*, *Epsilon*, *Zeta*, *Iota*, *Kappa*, *Henry Flad*, and *B. M. Harrod*, were operated at various crossings from Medleys, 31 miles below Cairo, to Youngs Point, just above Vicksburg, or 597 miles below Cairo.

Four regular bar-survey parties were in the field during the season, and surveys were made of troublesome crossings as frequently as possible, but owing to the great length of river to be covered these surveys were less frequent than could be desired. Inspection trips were also made over the river as often as possible, but these, too, were at too great intervals owing to the slowness of the boat available for use of the superintendent of dredging. Information was given to pilots and others engaged in navigating the river, and buoys and other marks showing the channel were placed where required.

The river reached a moderately low stage quite early in the season, the Cairo gauge reading 8.2 feet on August 22, 1910. This is the lowest August reading since 1901. This was followed by rises in September and October, but the river was continuously low during November. The lowest reading of the season at Cairo was 5.12 feet on November 14. The usual winter rise set in at the end of December.

The following are the lowest gauge readings in 1910 at all stations from Cairo to Red River Landing, with the lowest readings of the previous season for comparison:

Station.	Low water, 1910.		Low water, 1909, gauge reading.	Difference.
	Date.	Gauge reading.		
	1910.	*Feet.*	*Feet.*	*Feet.*
Cairo	Nov. 14	5.12	6.94	−1.82
Columbus	Nov. 25	5.50	7.42	−1.92
New Madrid	Nov. 26	4.42	6.71	−2.29
Cottonwood Point	Nov. 26	.22	2.15	−1.93
Fulton, Tenn	Nov. 27	2.86	5.38	−2.52
Memphis	Nov. 28	3.15	5.44	−2.29
Mhoon Landing	Nov. 17–20, 26, 28, 29	−1.9	.2	−2.1
Helena	Nov. 29, 30	3.23	5.70	−2.47
Sunflower Landing	Nov. 29–Dec. 1	4.75	7.15	−2.40
Mouth White River	Nov. 30, Dec. 1	7.80	9.62	−1.82
Arkansas City	Dec. 1, 2	4.19	5.9	−1.71
Greenville	Dec. 1, 2	1.87	3.54	−1.67
Lake Providence	Dec. 1, 2	.72	2.90	−2.18
Vicksburg	Dec. 3	1.37	4.18	−2.81
St. Joseph	Dec. 3, 4	−3.75	− .95	−2.80
Natchez	Dec. 3–5	4.0	6.7	−2.7
Red River Landing	Dec. 3	3.67	5.35	−1.68

The following is a brief statement of the operations of each dredge while in the field during the low-water season of 1910, taken mainly from the report of Asst. Engineer F. H. Hilliard, superintendent of dredging. The work and division of time of each dredge is given in Table 6 accompanying this report.

Dredge "Gamma."—This dredge, with pontoons, pile sinker, and coal barge, in tow of the steamer *Nokomis*, left the dredge fleet on August 12 and arrived at Maverties Landing on the 15th. The dredge was moved out on Island No. 14 crossing on August 17 and commenced dredging on the same day. Dredging was continued until the 23d. At 8.25 p. m. on this date the valve rod of the high pressure engine broke, which necessitated suspension of operations for repairs. Repairs were completed and the dredge was again moved out on the crossing on August 26. On account of the character of the material encountered, which was stiff mud, a new location was selected where dredging was continued until 7.50 a. m. on August 28. At this time work was again suspended on account of breaking of the brass valve seat on the high pressure engine. Since the necessary repairs could not be completed within 10 days or 2 weeks, the *Gamma* was moved to the dredge fleet at West Memphis, leaving Fritz on August 30, and arriving at the dredge fleet on the 31st.

The dredge was again placed in commission and moved out on the bar opposite the dredge fleet on September 15. The repairs to the valve seat of the high pressure cylinder of the main engine were completed on the 16th. Some tests of the new pump were made, using the old suction head. While dredging in 5 feet of sand and pulling ahead at the rate of 300 feet per hour the pinion which drives the gear wheel of the port winding drum was broken. Dredging was continued at intervals, using a 2-inch manila line instead of the port cable. A new pinion was procured and installed. On October 10 the dredge was moved to the bank for the purpose of installing the new suction head. On completion of the installation some experimental determinations were made of the percentage and distribution of sand in the discharge pipe. The *Gamma* departed for Walts crossing on October 29 and arrived there on the 30th. Work was begun on this crossing on the 30th and was completed at midnight on

November 1, when the dredge was moved out of the channel. Some delays in dredging were caused by clogging of the discharge pipe and the breaking of the lever of the main pump siphon valve. On November 2 the plant was started for foot of Bullerton crossing and arrived at that point on the 3d. Dredging was commenced on the 3d and continued until the 8th, when the dredge was moved out of the channel to await a lower stage. Delays in dredging were on account of cleaning suction pipe, repairs to condenser valves, and washing boilers. This dredge remained at the bank near Drivers Landing until November 15. On this date she was moved down to Island No. 35 crossing, and commenced dredging on the 16th. The work in this crossing was completed on the 18th and the dredge was swung out of the channel. The steamer *Nokomis*, tender to the dredge *Gamma*, departed for the coal fleet on November 17 to procure a barge of coal, and returned on the 19th. On the 20th the plant was moved down to Pecan Point and tied up there to await a lower stage. Dredging becoming necessary a second time in Walts crossing, the plant was moved down to Deans Island on November 21, and on the 22d out onto Walts crossing. After delays in placing plant on the crossing, on account of grounding coal barge, breaking the spud, and injuries to the wheel and rudder of the tender, dredging was commenced on November 26 and the work completed December 3. Delays in dredging were caused by clogging of the suction and discharge pipes. On completion of the work in Walts crossing, the dredge was moved out of the channel and tied up to the bank at Deans Island. The *Gamma* lay at the bank at Deans Island until December 11, when the plant was moved to the dredge fleet, arriving there the same day. On January 11 the dredge was moved out on the bar opposite the dredge fleet for the purpose of testing the drag suction head. The tests were discontinued on the 13th and the dredge was moved back into the fleet and laid up.

Dredge "Epsilon."—This dredge was moved out on the bar opposite the dredge depot on August 20 and departed for Pattons crossing, at the foot of President's Island, in tow of the steamer *Leota* on the 23d, arriving there the same day. Preparations for dredging were completed and work was commenced in this crossing on August 25. The work contemplated was completed at midnight on the 26th, and the dredge was swung out of the channel to await a lower stage. The depth in the crossing was increased from 7 to 11 feet. Some delays in dredging were on account of slipping off of rubber sleeves and parting of cables. The plant was moved to Helena, Ark., on September 2. On the 4th the dredge left Helena for Catfish Point, and arrived on the 5th. She was tied up at the bank at Catfish Point to await a lower stage. The *Epsilon* was moved out on the Catfish Point crossing on September 10. Dredging was commenced on September 11 and continued until midnight on the 13th, when a sharp rise in the river rendered further work unnecessary. The dredge was then moved to Greenville, Miss., leaving Catfish Point on the 14th and arriving at Greenville the same day. The plant remained at the bank at Greenville awaiting a lower stage until September 30, when it was again moved to Catfish Point, arriving there on October 1. Dredging was commenced on the 3d and continued until the 9th, when a satisfactory channel had been obtained. The *Epsilon* remained at Catfish Point until October 11, when she started for Rosedale, Miss. She arrived at Rosedale on the 12th, and was tied up at that point to await a lower stage. The steamer *Leota*, tender to the *Epsilon*, was dispatched up the river for coal on October 15 and returned on the 17th with two barges. The plant was moved down to Catfish Point on November 1. arriving there at 10.50 a. m. Dredging was commenced in Catfish Point crossing at 7.15 p. m. on this date, and continued until the 4th, when the dredge was moved to the side of the channel. A survey made on completion of the work showed that a few more cuts were needed. The dredge was therefore again placed in the crossing and work commenced on November 6. This work was completed on the 7th. The dredge was then moved to Ashton crossing (519), leaving Catfish Point on the 7th and arriving at Ashton on the 9th. Dredging was commenced on Ashton crossing on November 9 and continued until the 12th. On completion of the work the dredge was moved out of the channel to await a lower stage. Delays in dredging in Catfish Point were due to cleaning drift from the suction head, repairs to ponton couplings, winding engine, and suction hoist chain. The material in the crossing was medium sand with a small amount of gravel. The material at Ashton was medium sand. The plant left Ashton crossing on November 17 for Youngs Point (597) and arrived there the same day. Dredging in this crossing was commenced on the 18th and completed on the 20th. On the morning of November 21 the plant was moved to the bank in the canal at Vicksburg, and lay there awaiting a lower stage. Delays in dredging at Ashton were due to repairs to the winding engines. Delays in dredging at Youngs Point crossing were due to the breaking of ponton joints and hot journal bearings of the main engines. The material in Youngs Point crossing was medium sand with a considerable amount of driftwood. The tow left Vicksburg on December 8 for Greenville, Miss., arriving there on the 13th and departing for the dredge fleet on the 16th. It arrived at the latter point on the 24th. On arrival at the dredge fleet the *Epsilon* was laid up.

Dredge "Zeta."—This dredge was moved out on the bar opposite the dredge fleet on September 2 and placed in commission on account of the temporary withdrawal of the *Gamma* for repairs. On completion of repairs to the *Gamma* on the 14th the dredge was moved back into the fleet. The *Zeta* was placed in commission on November 5 and left the dredge fleet on the 6th for Josie Harry Chute in tow of the steamer *Choctaw*, arriving there the same day. On account of the extremely swift current in the head of this chute considerable difficulty was experienced in maneuvering the dredge into position and holding it there until preparations for dredging were completed. While holding the dredge in position the fusible plugs in one battery of the *Choctaw's* boilers were melted, and as the boat was unable to hold the plant against this swift current with only one battery of boilers it was necessary to run a line ashore and check the tow by this means. Delays in dredging were caused by the breaking of cable straps, an accident to the governor on the main engines, slipping off of rubber sleeves, the running hot of main engine journals, and the breaking of the crosshead brasses. The material encountered was sand and stiff mud. On November 8 the steamer *Choctaw* was sent to the dredge depot for repairs to its safety valve, and returned on the 9th. The plant departed from Josie Harry Chute for Catfish Point on November 15 and arrived on the 17th, taking a partly loaded coal barge from the *Iota* on the way down. Dredging was begun on November 18 and continued until midnight on the 21st. Delays in dredging were due to breaking of the follower head on steam end of the condenser, breaking of discharge-pipe bands, and shortage of labor for a short time. On November 22 the plant was moved down to Moss Lake and commenced dredging in this crossing at 9.15 p. m. on the same day. A satisfactory channel was completed in Moss Lake crossing on the 25th and the dredge was moved to the bank to await a lower stage. On November 26 the plant was moved to Greenville, Miss. and tied up to await further necessity for dredging. The *Zeta* left Greenville in tow of the seamer *Choctaw* for winter quarters on December 8. On December 11 the plant was tied up at Wood Cottage, and the *Choctaw* dispatched to the dredge fleet for coal. The *Choctaw* returned to the dredge with coal and the trip up the river was resumed on the 14th. The tow arrived at West Memphis on December 18 and the dredge was laid up.

Dredge "Iota."—This dredge was moved out on the bar opposite the dredge depot on August 11, and after necessary preparations had been made, left the fleet on the 12th and arrived at Deans Island on the 14th. On August 15 she left Deans Island for Island No. 35 crossing and arrived there at 3.30 p. m. on the same day. Work on this crossing was commenced by the *Iota* on the 18th and continued until the 23d. On completion of the work, the dredge was moved to the bank to clean boilers and await a lower stage. On August 24 the *Iota* was moved down to Walts crossing and commenced dredging at 9.50 p. m. on the same day. Dredging was continued until the 27th. Some delays in dredging were on account of minor repairs to machinery and pontoons. On completion of the work on this crossing the *Iota* was moved up to Pecan Point on the 29th and remained at that point awaiting a lower stage until October 1. This dredge was moved from Pecan Point up to Island No. 35 crossing on October 1 and commenced work at 2.20 p. m. on the same day. Dredging was continued until the 3d, and on the 4th the dredge was moved back down to Pecan Point and tied up there to await a lower stage. Delays in dredging were caused by the breaking of the valve stem of the blow-off valve, waiting for steam, and severe wind storm. On November 1, the *Iota* left Pecan Point for Daisy and arrived there on the 3d. When landing at the dredge fleet for suplies, a flange on one of the discharge pipes was broken, necessitating delay until repairs could be made. Preparations for dredging in Daisy crossing were commenced on November 3, but on account of the shape of the channel and direction of the current, the dredge was unable to drop over the reef. It was necessary, therefore, for the dredge to cross the reef in the natural channel and wait until a pile sinker could be obtained to sink the piles. When this had been done, the cables were run to the piles by means of the pile sinker. Dredging was commenced on November 4 and continued until the 13th, when the work projected had been completed. Delays in dredging were due to low steam pressure, repairs to discharge pipe, cleaning boilers, repairs to cable straps, grounding of pontoons, and repairs to the jet pump and main engines. The material dredged was sand and gravel. The *Iota* left Daisy crossing for the dredge depot on November 16 and arrived there the same day. She there lay at the bank, awaiting a lower stage until the 29th, when she departed for Daisy crossing again, arriving there on the same day. Dredging was commenced at 12.25 p. m. Dredging in Daisy crossing was completed on December 5, when the dredge was moved to the bank to clean boilers and await a lower stage. Some delays in dredging were caused by repairs to the pipe line, wind storm, and waiting for daylight. A considerable amount of time was lost on account of low steam pressure, due to the poor quality of the coal obtainable at Memphis, the supply of Pittsburgh coal having been exhausted. Other delays were caused by the grounding of the pontoons and coal barge, cleaning suction head, and passing boats. The material dredged was sand and gravel. The *Iota* remained at the bank at Thelma Landing, Ark., awaiting a lower stage, until December 31, when she was moved to the dredge fleet and withdrawn from service. While lying at the bank at Thelma Landing new packing rings were made for the high-pressure cylinder of the main engines and other repairs made.

Dredge "Kappa."—This dredge was moved out on the bar opposite the dredge depot on August 10. Tow was made up and other preparations made for moving to the chute of Island No. 30 crossing, and she left the fleet on the 11th for that place, with the steamer *Nokomis* towing the coal barge and pontoons. The *Kappa* arrived at the head of chute of Island No. 30 crossing on the 13th, and dredging was commenced in this crossing on the same day and continued until the 22d, when the dredge was swung out of the channel to clean boilers. At 5.20 a. m. on August 14 the hubs and follower head of both water pistons of the air pump were broken. The dredge was delayed on this account from 5.20 a. m. on the 14th until 1.30 a. m. on the 16th. Other delays were caused by repairs to pontoons, cleaning fires, grounding of pontoons, and passing boats. The dredge was moved out on the crossing again on August 25 to widen and deepen a narrow place in the channel near its upper end. The work in the upper end of the crossing was completed on the 29th, when the dredge was moved to the bank to clean boilers preparatory to commencing work in the lower end of the crossing. While lying at the bank some repairs were made to the pontoon coupling and to rubber sleeves. The work of widening the channel at the lower end of the crossing was commenced on August 31 and completed on September 6, when the dredge was moved out of the channel to clean boilers and await a lower stage. Some delays in dredging were on account of cleaning fires, pulling snags, and passing boats. The *Kappa* remained at the bank in the chute of Island No. 30 awaiting a lower stage until September 23, when dredging in the upper part of Island No. 30 crossing was commenced. This work was completed on October 2. Delays were on account of deflecting pontoons, repairs to pontoon couplings, passing boats, and cleaning boilers. While lying at the bank some minor repairs were made to the machinery, and some painting was done. On October 8, on account of rising river and drift, she was moved across the river to Osceola Bar for safer harbor. She remained at this point awaiting a lower stage until the 26th. While lying at Osceola Bar some minor repairs were made to the discharge pipe, the peripheral lining of the main pump was repaired, a crack in the aftersheet of the starboard boiler was repaired by boilermakers sent from the fleet, and the roof was patched and painted. This dredge was moved up to Gold Dust crossing on October 26, and dredging in this crossing was commenced at 12.45 p. m. on the same day and continued until the 31st, when the dredge was moved out of the channel to clean boilers. There were delays in dredging on account of priming pump and repairs to broken drawbars on the pontoons. The *Kappa* was moved out onto Gold Dust crossing again, and dredging was resumed on Cut No. 11 on November 1 and continued until the 3d, when the necessary work was completed. The dredge was then moved down to New Haven crossing, where dredging was commenced on November 4. The work was completed on the 10th, and the dredge was moved back up to Gold Dust crossing to widen and straighten the channel at that point. She arrived in the crossing at 4 p. m. the same day. Dredging was begun on the 11th and continued until the 21st, when the work was completed. The dredge was then moved down to Luxora and tied up.

While at Luxora a slight bag in one of the boilers was set up and the furnaces were repaired. Delays in dredging were due to waiting for coal, cleaning boilers, passing boats, hot crank pin, broken journal bolt, priming pump, removing snags from the channel, grounding of dredge and coal barge, and waiting for daylight to place plant. The material encountered was coarse sand, gravel, and blue mud at Gold Dust, and sand, gravel, and drift at New Haven. The *Kappa* lay at the bank at Luxora, Ark., awaiting a lower stage until December 30, when she departed for the dredge fleet, arriving at 10.30 a. m. on the 31st.

Dredge "Henry Flad."—This dredge was moved out on the bar opposite the dredge depot on August 9. Property was checked and stores placed on board, and she left for Island No. 35 crossing on the 10th and arrived there on the 11th. Preparations for dredging were completed at 3.30 p. m. on August 11. At 3.50 p. m. the lower section of pontoon broke a coupling and went adrift. The mate with a boat crew was sent after it. The dredge *Kappa*, which was en route upstream in the bend below the *Flad*, caught the pontoons and towed them up to the *Flad* the following morning. Dredging was resumed on August 12 and continued until the 15th, when the dredge was moved out of the channel to clean boilers. The *Flad* left Island No. 35 crossing with the steamer *Leota*, towing her coal barge and pontoons on August 16, and arrived at the lower crossing in the chute of Island No. 30 on the 17th. Dredging was commenced at 12.05 p. m. on the same day and continued until the 22d, when the dredge was moved to the bank to clean boilers and make some minor repairs to machinery. Dredging was resumed on August 24 and continued until the 27th. A great deal of delay was caused by snags, drift, and wreckage embedded in the sand. On August 30, the *Flad* started for Fritz crossing and arrived there on September 1. The dredge was moved out on the crossing and work was commenced on September 4 and continued until 6.15 a. m. on the 8th, when a satisfactory channel had been completed. The dredge was moved to the bank and remained there awaiting a lower stage until November 2, when she was moved out onto Fritz crossing. Dredging was commenced in Cut No. 12 at 12.45 p. m. and the work was continued until the 5th, when a satisfactory channel had been obtained. Delays in dredging were occasioned by the repairs to the low-pressure piston head of the main engines, washing out discharge pipe, repairs to broken chains on the pontoons and repairs to main engines. The *Flad* remained at the bank at Fritz Landing until November 8. She was then sent to the coal fleet above Caruthersville to tow a barge of coal to Point Pleasant for the dredge *B. M. Harrod*. She returned to Fritz Landing on the same day with the coal barge and remained there awaiting arrival of a pilot until the 9th. The coal was delivered to the *Harrod* at Point Pleasant on the 10th and the *Flad* returned to Fritz Landing the same day. On return from delivering some empty coal barges to the coal fleet, the *Flad* was tied up at Fritz Landing to await a lower stage. On December 30 she departed for winter quarters at the dredge fleet. She arrived there on January 1 and was withdrawn from commission. While lying at the bank at Fritz Landing, repairs were made to the dynamo engine and other parts of the machinery.

Dredge "B. M. Harrod."—This dredge was moved out on the bar opposite the dredge depot on August 3 and left on the 5th for Point Pleasant crossing. She arrived at Reelfoot Landing on the 8th and coaled on the 9th. A survey of Island No. 14 crossing showed that there was less water there than at Point Pleasant, so the dredge was placed in this crossing on August 10 and continued dredging until the 13th, when a channel 10 feet in depth had been obtained. Boilers were cleaned, tow made up, and the plant left for Point Pleasant crossing on August 14 and landed at the foot of Mars Towhead at 2.30 p. m. the same day to await completion of survey. Work was commenced in Point Pleasant crossing on the 15th and continued until the 18th. On completion of this work the dredge was moved down to Lower Point Pleasant, or Darnells, crossing, and dredging commenced on August 19. Work in this crossing was continued until the 27th, when the dredge was swung out of the channel to clean boilers. She remained here until the 31st, when tow was made up and the plant moved to Upper Point Pleasant crossing, and commenced dredging on the same day. This work was completed on September 5, and on the 6th the dredge was moved down to the lower part of the crossing and commenced work there on the same day. This work was completed on the 7th, when the dredge was swung out of the channel to await a lower stage. While taking in the slack of the port cable on September 16 the piston head of the port winding engine was broken. This was repaired. This dredge remained at the bank at Point Pleasant awaiting a lower stage until September 25, when she was moved down to the lower part of Point Pleasant crossing. Dredging was commenced in this crossing on the 26th, and continued until midnight on the 27th. Tow was made up, and the plant was moved to Tiptonville on the 28th and tied up there to await a lower stage. Some delays in dredging were on account of waiting for steam and resetting piles. On October 7 the dredge was moved down to the coal fleet near Caruthersville, Mo., and remained there until October 25, when she departed for Point Pleasant crossing. She arrived there on the 26th and commenced work in the middle crossing on the 27th. This work was completed on the 30th. On October 30 the dredge left Point Pleasant for Medleys crossing, arriving there on the 31st. The work in Medleys crossing was begun on November 1 and completed on the 5th, when the dredge was moved to the bank to make up tow. Delays in dredging were caused by the clogging of the suction head and grounding of the pontoons. A survey of Medleys crossing, made on completion of the work, showed that some additional work through the upper end of the dredged channel was desirable, and the dredge was again moved out onto the crossing. Dredging was resumed on the 7th, and continued until 4.45 a. m. on the 8th, when a satisfactory channel had been completed. The plant left for Point Pleasant crossing on November 8 and arrived at Darnells on the 9th. The dredge remained at this point until the 23d, when she was moved down to Tiptonville for better harbor. She lay there until 9.30 a. m. on December 30, when she departed for the dredge fleet. On arrival at the dredge depot on January 2, the *Harrod* was withdrawn from commission.

A summary of the work and division of time of the dredges while in the field during the low-water season of 1910 is given in Table 6, accompanying this report.

The amount of material moved by the dredges during the season of 1910, computed in the usual manner, was 2,471,040 cubic yards.

The following are the quantities dredged each year from 1899 to 1910:

	Cubic yards.		Cubic yards.
1899	1,612,223	1905	197,847
1900	1,145,558	1906	297,300
1901	1,666,465	1907	1,151,739
1902	813,380	1908	2,167,766
1903	891,098	1909	1,260,171
1904	2,149,734	1910	2,471,040

A statement of the cost of dredging operations from May 1, 1910, to April 30, 1911, is given in Table No. 8, accompanying.

DESCRIPTION OF BARS AND ACCOUNT OF WORK ON EACH DURING THE LOW-WATER SEASON OF 1910.

The dredging operations of 1910 extended from Medleys (31) to Youngs Point (597), a distance of 566 miles measured on the line midway between banks. In this stretch of river the dredging operations were distributed among the 20 different shoals described below. In addition to the shoals being numerous and widely scattered, many of them were exceedingly troublesome and required repeated dredging.

Medleys.—The shoal at Medleys, the first crossing below Cairo at which dredging was required, did not develop until the last of October. Map of October 29 shows clearly the conditions before dredging and that of November 8 the results of six days' dredging with the *Harrod.* An excellent channel was formed and maintained through the remainder of the low-water season without further dredging. The chief difficulty was the character of the material, which contained a large proportion of gravel.

Point Pleasant.—Under this heading are included Upper Point Pleasant and Darnells Crossings, since both of these shoals must be crossed in traveling from Point Pleasant on the west bank to Darnells Point on the east, a distance of about 3 miles. The general form of the bar was almost exactly similar to that of 1909, with the exception that the lower channel, down the west shore and over to Darnells Point, which was selected for improvement in that season, was eliminated from consideration by a reef which had formed across its upper end, just below Point Pleasant Landing. This forced the greater volume of water over to Mars Towhead and down the shore to Darnells Point. The distance between the upper and lower pools by this route was approximately 3 miles, about 2 miles of which required dredging. Upper Point Pleasant required dredging twice, August 15 to 18, and August 31 and September 5. The first work was not continued until a satisfactory channel had been completed owing to misconception of the dredge master as to the extent of work required. After the second dredging, however, no further work was necessary. In Lower Point Pleasant dredging was also required twice, the channel having filled in from the rapid caving of the Darnells Towhead Bar, following the October rise to 17 feet on the New Madrid gauge. The difficulty in Darnells Crossing was due to the meeting of the current of the lower channel, mentioned in an earlier paragraph, and the upper channel, or the one selected for improvement. This caused shifting of current direction and consequent instability of channel location. It will be noted that during the long period of low stage extending through November and December, no dredging was required. The success of the *Harrod* in maintaining satisfactory channels at Point Pleasant, evidenced by maps made at frequent intervals during the season, is worthy of especial mention.

Island No. 14.—For several years the channel in the vicinity of Reelfoot and Island No. 14 has crossed the river from Reelfoot to the corner of the island, down the shore of the island, and back to the Tennessee shore below Fritz Landing. From information furnished by map of Reelfoot dated August 9, 1910, and soundings taken down the Tennessee shore below the limits of the survey, the old channel following the shape of the dry sand bar was selected for improvement and was maintained until August 18. At this time extended surveys showed that the water was leaving the old channel and following the Tennessee shore down by Fritz Landing. An attempt was made to anticipate this channel change by dredging through the reef below Fritz, but the material encountered (mud and gravel) prevented satisfactory operations, and it was necessary to seek a more favorable location. This was found as shown on the map of August 24. An accident to the *Gamma's* machinery prevented prompt completion of this channel. The accident to the *Gamma* occurred on August 28, and it was not until September 1 that another dredge, the *Henry Flad*, could arrive from Island No. 30. A very satisfactory channel was completed on September 8, and no further dredging was required until November 2, when the *Flad* was again placed in the crossing four days to remove the sand deposited by the October rise.

Chute of Island 30.—Surveys of Gold Dust Crossing of August 15 and Chute of Island 30 Crossing of August 12 showed that at that time the channel was through the chute with a margin of 3 feet, and a comparison with an earlier survey showed that the channel in Gold Dust Crossing was very materially deteriorating. The current through the chute was strong, while in Gold Dust Crossing it was very sluggish. For this reason the channel through the chute was selected for improvement. Dredging operations were commenced in the head of the chute by the *Kappa* on August 13. The material encountered contained quite a large proportion of gravel, which rendered progress quite slow. A satisfactory channel was obtained, however, and was maintained until October 22, when the last survey was made. At this time, acting under instructions to make a satisfactory channel, if possible, down through the main river to the right of Island 30 and abandon the channel in the chute, the *Kappa* was placed in Gold Dust Crossing and commenced dredging on the 26th. After a large amount of dredging extending through a period of three weeks an excellent channel was obtained.

Operations in the chute were successful, but on account of gravel, drift, and snags encountered progress was necessarily slow. Had the character of the bottom been known in advance it is probable that this channel would not have been attempted, but examinations of this kind are not practicable with present facilities and limited reconnoissance outfit. The interesting facts, however, are that operations in the chute were successful and that after the channel had been established, equal success followed the dredging in the main river to the right of Kate Aubrey Towhead. The dredge *Kappa* accomplished excellent results in both locations.

New Haven.—This was a shoal in a bank channel below New Haven. Maps of November 3 and November 13 show conditions before and after dredging. The work of the *Kappa* was successful.

Foot of Bullerton.—This was a short shoal in the crossing from Plum Point to the foot of Bullerton Towhead. About three days dredging by the *Gamma* opened up a satisfactory channel.

Island 35.—This was a troublesome shoal which developed early in the season. It required dredging four separate times, on account of the washing of the loose sand, through which the course of the channel above lay, down onto the reef

The *Flad* worked in this crossing August 12 to 15; the *Iota* August 18 to 23 and from October 1 to 3; the *Gamma* November 16 and 17. The work in each case was successful.

Walts.—At the time the first survey was made the channel made the crossing in to Deans Island Bar, and after following the shape of the bar for about three-fourths of a mile crossed into the bend at Massey Light. The shoal was in the crossing going into the bar. In the early part of November, however, the lower crossing to Massey Light began to fill up and the best water was found in a new channel from the corner of Deans Island to Thomas Light about a mile above Massey Light. This channel was improved with excellent results.

Foot of Presidents Island, or Pattons.—About August 20 it became evident that the channel below the mouth of Nonconnah Creek would shoal to less than 9 feet. Since the bar at that point was heavy gravel and a good channel could be obtained around to the right of the island by dredging a short shoal near the foot, this was done and the channel maintained down through the old river until the exceedingly swift current had washed out a channel at Nonconnah, where the gravel bar rendered dredging operations very difficult and uncertain. The natural channel at Nonconnah is shown on map of November 29.

Josie Harry Chute.—In the vicinity of Horn Lake crossing an increasing volume of water had been flowing down through the chute of Josie Harry Towhead, and on account of the shifting, tortuous, and uncertain character of the channel in the old Horn Lake crossing and the evidence that the chute channel would respond to improvement operations, the latter channel was selected for improvement. Dredging operations by the *Zeta*, November 8 to 14, were eminently successful.

Daisy.—On account of the shape of the bar and the direction of the current Daisy crossing was one of the most difficult to improve of any through which dredging was required. As will be seen by an examination of any of the maps of this shoal a high middle bar or ridge extended from a point below Graves Bayou, on the Arkansas shore, to a junction with the Cow Island Bar. The crest of this bar was generally but 1 foot below mean low water, with low spots 3 feet below. The length of this reef from the point where it joined the Arkansas shore to its junction with Cow Island Bar was about 1¼ miles and its direction very nearly parallel to the Arkansas shore line. Since the water flowed over this reef for its full length there was no tendency to back the water up in the upper pool and force the flow over the reef in a direction nearly normal to the general direction of the contours, but the direction of flow was approximately parallel to shore lines and reef contours. This condition rendered dredging operations very difficult, since in making a channel it was necessary to cut through the sand ridge separating the upper and lower pools on an axis making a considerable angle with the direction of the current. Notwithstanding these difficulties, the work of the *Iota*, November 4 to 13 and November 29 to December 5, was very successful and a good channel was maintained.

Catfish Point or Towhead.—The shoal at this point developed early in September and required dredging on three separate occasions. The first work was done by the *Epsilon* September 11 to 13. The rise in the latter part of September obliterated the resulting channel. A small amount of work was done by the same dredge just before the October rise. When the stage declined rapidly in the latter part of October the *Epsilon* opened up this channel again and the *Zeta* deepened and widened the *Epsilon's* channel November 18 to 21. The fine, loose sand in this crossing was washed down and piled on the reef by every slight rise, necessitating repeated dredging. The shoal was very long, and both the *Epsilon* and *Zeta* were very much handicapped on account of not being able to obtain satisfactory deflection of their pontons. The pontons are of the old type, having the air chambers extending longitudinally along the pipe on either side.

Moss Lake.—The work at Moss Lake consisted in widening the channel where it passed close to a large drift pile, which frightened pilots out of the narrow channel.

Ashton.—This was a short shoal and required only a small amount of dredging.

Youngs Point.—This shoal, just above Vicksburg, did not develop until about the middle of November and then required only about three days' dredging by the *Epsilon.*

SURVEYS.

During the dredging season of 1910, 136 surveys were made of shoal crossings. While the lowest point at which dredging was required was Youngs Point, surveys were made at Diamond Island 614 and at New Town, 618 miles below Cairo. Four bar-survey parties, on the small steamers *Venus*, *Vulcan*, *Mercury*, and *Mars*, were engaged on this work.

The following crossings were surveyed and buoyed when necessary, in addition to those where dredging was required:

Joe Eckles	1	Head of Island No. 63	1
O'Donnells	2	Wilsons Point	1
Island No. 34	1	Arcadia	1
Berkleys	1	Hendersons	2
Nonconnah	1	Diamond Island	1
Foot of Presidents Island	2	New Town	1
Pecan Point	1	Foot of Josie Harry Chute	1

INSPECTION.

The steamer *Search* was used during the low-water season of 1910 as an inspection boat by the superintendent of dredging in examining the condition of the channel and directing the work of the dredges. The steamer *Choctaw* was also used for one trip in August. In addition to this supervision of the work by the superintendent on the trips of these boats, supplies and men were carried from Memphis to all the dredges and bar-survey parties in the field, and all shoal crossings were sounded. The soundings obtained on these trips are given in Table No. 4.

The river at Cairo was unusually low towards the latter part of May, the Cairo gauge reading 14.4 feet on May 25, 1911. This is the lowest May reading since 1895. On May 24, 1911, the dredge *Gamma*, in tow of the steamer *Choctaw*, was sent to Point Pleasant to be in readiness there should shoals develop. The survey boat *Venus* and party accompanied the dredge, and the outfit arrived at Point Pleasant on May 30. The steamer *Leota* made an inspection trip of the river from Memphis to upper Point Pleasant, leaving the fleet on May 24. The least depth found on this trip was 10½ feet, at Round Lake Crossing 160 miles below Cairo. The dredge *B. M. Harrod* and survey boat *Vulcan* have been made ready at the fleet to go to Round Lake should it become necessary to dredge there.

Up to the date of this report no dredging has been required since the close of the low-water season of 1910, last December.

The following papers and plates accompany this report:

Money statements.

Abstract of contracts in force.

Commercial statistics.

Statement of charts issued and sold.

Table No. 1. Highest and lowest gauge readings in 1910, Mississippi River and tributaries.

Table No. 2. Maximum heights above mean Gulf level at high water and regular gauges on the Mississippi River from Cairo to Head of the Passes, with high water of 1903 for comparison.

Table No. 3. Cost of dredging operations, May 1, 1910, to April 30, 1911.

Table No. 4. Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910.

Table No. 5. Dimensions of channels through bars, Mississippi River below Cairo, dredging season of 1910.

Table No. 6. Summary of dredging operations, Mississippi River below Cairo during the low-water season of 1910.

Table No. 7. Highest gauge readings, Mississippi River and tributaries in 1911 to June 30.

Plate 1. Hydrograph of Mississippi River, Cairo, Ill., to Fort Jackson, La., June 1, 1910, to May 31, 1911.

Plate 2. Profile Mississippi River, Cairo Ill., to Head of Passes, Louisiana, high water of 1911. Also profiles of certain previous high and low waters.

Appendix A. Laws affecting the Mississippi River Commission, July 1, 1910, to June 30, 1911.

Respectfully submitted.

CHAS. L. POTTER,
Lieutenant Colonel, Corps of Engineers, United States Army,
Secretary Mississippi River Commission.

Col. WM. T. ROSSELL,
Corps of Engineers, United States Army,
Acting President, Mississippi River Commission.

MONEY STATEMENTS.

Appropriation for improving Mississippi River.

July 1, 1910, balance unexpended		$615,693.01
Amounts allotted from appropriation by river and harbor act approved June 25, 1910 ("Mississippi River Commission," $5,000; "Surveys, gauges, and observations," $45,000; "Dredges and dredging," $35,000), allotments approved by Acting Secretary of War July 6, 1910	$85,000.00	
Amounts allotted from appropriation by river and harbor act approved Feb. 27, 1911 ("Mississippi River Commission," $30,000; "Surveys, gauges, and observations," $66,000; "Dredges and dredging," $329,000), allotments approved by Assistant Secretary of War May 3, 1911	425,000.00	
Amounts transferred from allotments in charge of first and second districts officer and of third district officer, in payment of purchases of coal, credited to allotment for "Dredges and dredging," as follows:		
March, 1911 (first and second)	12,609.77	
April, 1911 (third)	1,941.22	
June, 1911 (first and second)	3,837.10	
Amount transferred from appropriation for improving Arkansas River, Ark. (dredging), by Treasury transfer settlement, for fuel and miscellaneous supplies furnished dredging plant on Arkansas River in 1907 and 1908, credited to allotment for "Dredges and dredging," July, 1910	5,745.61	
Amount transferred from appropriation for removing obstructions in Mississippi, Atchafalaya, and Old Rivers, 1911, by Treasury transfer settlement, for coal furnished the United States snag boat *J. N. Macomb*, credited to allotment for "Dredges and dredging," February, 1911	60.00	
Amount transferred from appropriation for improving Mississippi River from mouth of Ohio River to Minneapolis, Minn. (mouth of Missouri to Minneapolis, general improvement), by Treasury transfer settlement, for expenses incurred in obtaining discharge measurements of the upper Mississippi River, credited to allotment for "Surveys, gauges, and observations," May, 1911	285.00	
Amounts transferred from appropriations for improving White River, Ark ($176.18), and for improving Arkansas River, Ark. ($352.37), by Treasury transfer settlement, for docking and repairing United States snag boat *C. B. Reese*, credited to allotment for "Dredges and dredging," June, 1911	528.55	
		535,007.25
		1,150,700.26
June 30, 1911, amount expended during fiscal year		444,097.85
July 1, 1911, balance unexpended		706,602.41
July 1, 1911, outstanding liabilities	37,453.89	
July 1, 1911, amount covered by uncompleted contracts	3,453.02	
		40,906.91
July 1, 1911, balance available		665,695.50

Appropriation for gauging waters of the Mississippi River and its tributaries.[1]

July 1, 1910, balance unexpended		$1,984.95
Amount allotted by Chief of Engineers, July 27, 1910, from permanent annual appropriation made by section 6 of river and harbor act of Aug. 11, 1888. as amended by section 9 of river and harbor act of June 13, 1902		9,600.00
		11,584.95
June 30, 1911, amount expended during fiscal year	$8,744.71	
June 30, 1911, amount reverted to Treasury during fiscal year	546.18	
		9,290.89
July 1, 1911, balance unexpended		2,294.06
July 1, 1911, outstanding liabilities	945.48	
July 1, 1911, amount covered by uncompleted contracts	23.42	
		968.90
July 1, 1911, balance available		1,325.16
Amount that can be profitably expended in fiscal year ending June 30, 1913, exclusive of the balance unexpended July 1, 1911		9,100.00

Itemized statement of expenditures during the fiscal year ending June 30, 1911, submitted in compliance with requirement of section 6 of river and harbor act of Aug. 11, 1888.

Observations:		
Pay of permanent gauge observers		$3,600.00
Inspections and repairs:		
Inspection of gauges on Mississippi River by junior engineers and parties on steamers	$2,132.98	
Inspection of gauges on tributaries	435.62	
Renewals and repairs of gauges and bulletins	375.95	
		2,944.55
Instruments:		
Purchase of carrying case		3.25
Office expenses and contingencies:		
Pay of assistant and junior engineers, recorders, and clerks	1,847.08	
Stationery, printing, office rent, etc	349.83	
		2,196.91
		8,744.71

CONSOLIDATED STATEMENT OF APPROPRIATIONS EXPENDED UNDER THE SECRETARY, MISSISSIPPI RIVER COMMISSION, TO JUNE 30, 1911.

Appropriation for gauging waters of the Mississippi River and its tributaries.

Allotments from general appropriations for examinations, surveys, and contingencies of rivers and harbors by acts of—	
Mar. 3, 1871 (allotment Apr. 11, 1871)	$5,000.00
June 10, 1872 (allotment July 11, 1872)	5,000.00
Mar. 3, 1873 (allotment May 17, 1873)	5,000.00
June 23, 1874 (allotment July 29, 1874)	5,000.00
Mar. 3, 1875 (allotment Mar. 22, 1875)	5,000.00
Specific appropriations by river and harbor acts of—	
Aug. 14, 1876	5,000.00
June 18, 1878	5,000.00
Mar. 3, 1879	5,000.00
June 14, 1880	5,000.00
Mar. 3, 1881	5,000.00
Aug. 2, 1882	5,000.00

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[1] The custody and care of the gauges maintained under this appropriation were assumed by the Mississippi River Commission Feb. 11, 1901, on which date they were transferred to the secretary, under authority of Secretary of War, dated Jan. 25, 1901.

Deficiency act of Mar. 12, 1884	$2,100.00
Specific appropriations by river and harbor acts of—	
July 5, 1884	5,000.00
Aug. 5, 1886	5,000.00
Allotted from specific appropriation by river and harbor act of Aug. 11, 1888 (allotment Oct. 17, 1888)	8,700.00
Deficiency act of Oct. 19, 1888	3,600.00
Allotments from permanent indefinite appropriation made by section 6 of river and harbor act of Aug. 11, 1888, for fiscal years, viz:	
1890 (allotment Aug. 23, 1889)	9,000.00
1891 (allotment Aug. 19, 1890, $8,700, less $3,518.34 withheld in United States Treasury under ruling that only $6,000 can be expended each fiscal year)	5,181.66
1892 (allotment July 17, 1891)	5,100.00
1893 (allotment July 15, 1892)	5,500.00
1894 (allotment July 18, 1893)	5,500.00
1895 (allotment June 5, 1894)	5,500.00
1896 (allotment June 4, 1895)	5,500.00
1897 (allotment May 13, 1896)	5,500.00
1898 (allotment June 16, 1897)	5,500.00
1899 (allotments May 27, 1898, $5,500; July 12, 1898, $500)	6,000.00
1900 (allotment June 1, 1899)	5,500.00
1901 (allotment July 2, 1900)	6,000.00
1902 (allotment July 31, 1901)	6,000.00
Allotments from permanent annual appropriation made by section 6 of river and harbor act of Aug. 11, 1888, as amended by section 9 of river and harbor act of June 13, 1902, for fiscal years, viz:	
1903 (allotment July 23, 1902, $9,600, less $500 allotted Aug. 2, 1902, to St. Paul (Minn.) district)	9,100.00
1904 (allotment Apr. 18, 1903)	9,100.00
1905 (allotment Aug. 11, 1904)	9,100.00
1906 (allotment June 30, 1905)	9,100.00
1907 (allotment July 2, 1906)	9,100.00
1908 (allotment July 24, 1907)	9,100.00
1909 (allotment July 3, 1908)	9,100.00
1910 (allotment July 13, 1909)	9,100.00
1911 (allotment July 27, 1910)	9,600.00
Total	237,581.66

EXPENDED.

	To June 30, 1910.	During year ending June 30, 1911.	Total.
Expenditures	$212,629.76	$8,744.71	$221,374.47
Unexpended balances reverted to Treasury	13,366.95	546.18	13,913.13
Total	225.996.71	9,290.89	235,287.60
Unexpended balance June 30, 1911			2,294.06
Total appropriated, etc			237,581.66

Appropriation for waterway from Lockport, Ill., to St. Louis, Mo.

Act of June 13, 1902 (river and harbor)		$25,000.00
Amount transferred from allotment for "Survey of Illinois and Des Plaines Rivers, Ill.," as reimbursement		1,093.40
Total		26,093.40
Expended to June 30, 1906	$22,291.23	
Unexpended balance carried to surplus fund on June 30, 1909, under the provisions of section 10 of sundry civil act of Mar. 4, 1909	3,802.17	
		26,093.40

Abstract of contracts in force June 30, 1911, improving Mississippi River, Mississippi River Commission, secretary's office.

Contractor.	Amount and character of work.	Price per annum.	Date of contract.	Date of approval.	Date of beginning work.	Date of expiration.
			1911.		1911.	1912.
Nina Realty Co....	Lease of offices and storage rooms.	$6,724	June 9	Emergency contract.	July 1	June 30
C. H. Organ.......	Water-front privileges...	250	June 15	.....do...........	...do....	Do.

COMMERCIAL STATISTICS FOR CALENDAR YEAR 1910.

TABLE No. 1.—*Receipts and shipments.*

Tonnage between—	Number of passengers.	Grain and its products.	Cotton.	Cotton-seed and its products.	Live stock.	Coal and coke.	Lumber.
		Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
St. Louis and Cairo............	26,087	16,981	972	982	6,581	113,673	5,786
Cairo and Memphis............	47,233	15,669	13,815	8,276	3,780	508,696	72,880
Memphis and Vicksburg........	103,557	20,295	20,770	26,743	11,791	392,561	59,378
Vicksburg and New Orleans....	71,737	28,470	6,578	10,339	1,846	364,559	14,903

Tonnage between—	Logs.	Iron, steel, and metals.	Groceries and provisions.	Stone, gravel, and sand.	Oil.	Unclassified and miscellaneous.	Total.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
St. Louis and Cairo............	44,555	188	10,694	45,314	35	43,998	289,759
Cairo and Memphis............	335,662	20,828	17,211	21,481	....	20,897	1,039,195
Memphis and Vicksburg........	187,950	15,421	34,560	186,516	2,222	22,179	980,386
Vicksburg and New Orleans....	71,538	9,707	58,941	657,656	223,984	81,709	1,530,230

NOTE.—Each stretch is treated as a separate river, and tonnage carried between ports on different stretches will appear in the statistics of all intervening stretches; consequently the sum of the tonnage carried in the four stretches does not represent the total traffic on the river as a whole.

TABLE No. 2.—*Receipts and shipments at principal ports.*

Port.	Passengers carried in and out of port.	Grain and its products.	Cotton.	Cotton-seed and its products.	Live stock.	Coal and coke.	Lumber.
		Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
St. Louis, Mo..................	[1] 278,841	18,097	972	982	14,668	113,538	5,773
Memphis, Tenn..................	81,767	17,521	23,704	11,744	8,453	105,058	11,159
Vicksburg, Miss.[2]...............	18,640	5,888	3,862	8,396	525	26,728	4,386
New Orleans, La.[3]...............	76,609	374,797	396,591	128,606	15,838	358,267	1,083,490

Port.	Logs.	Iron, steel, and metals.	Groceries and provisions.	Stone, gravel, and sand.	Oil.	Unclassified and miscellaneous.	Total.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
St. Louis, Mo..................	33,320	416	14,774	....	....	61,436	263,976
Memphis, Tenn..................	81,125	12,001	20,455	19	1,727	32,033	324,999
Vicksburg, Miss.[2]...............	12,000	4,838	12,902	4,000	293	2,160	85,978
New Orleans, La.[3]...............	109,543	95,805	1,243,642	66,599	313,795	708,112	4,895,085

[1] Includes 228,138 passengers in local excursion traffic.

[2] The traffic with the Yazoo River and its tributaries not included.

[3] Includes exports and imports and the domestic coastwise traffic as far as reported.

TABLE No. 3.—*Seagoing traffic at New Orleans, La.*

Arrivals and departures.	Number.	Tonnage.
Foreign-bound vessels	2,091	3,982,708
Coastwise vessels	755	1,961,345
Total	2,846	5,944,053

RECEIPTS AND SHIPMENTS.

	Tons.
Grain and its products	353,735
Cotton	390,552
Cotton seed and its products	125,831
Live stock	15,042
Coal and coke	40,470
Lumber	1,076,319
Logs	60,783
Iron, steel, and metals	86,568
Groceries and provisions	1,188,443
Oils	282,612
Stone, gravel, etc	10,599
Miscellaneous and unclassified	669,255
Total	4,300,209

TABLE No. 4.—*Ferry traffic.—Freight carried.*

Location of ferries and transfers.	Number of passengers.	Grain and its products.	Cotton.	Cotton seed and its products.	Live stock.	Coal and coke.	Lumber.
		Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
At St. Louis, Mo	1,207,915	667,973	10,814	1,785	44,934	2,936,553	594,982
At Chester, Ill.; Moro, Ill.; Commerce, Mo	10,607	3,143	....	....	65	298,112	59
At Cairo, Ill., to Birds Point, Mo., Greenfield, Mo., and Wickliffe, Ky.; at Belmont, Mo., to Columbus, Ky.; at Cottonwood Point, Mo., and Nebraska Landing, Tenn	141,001	16,887	193	138	1,719	1,045	8,600
At Memphis, Tenn., to Hopefield and Mound City, Ark	90,250	29,423	43,585	8,010	6,969	38,730	53,588
At Hales Point, Tenn.; Helena, Ark.; and Arkansas City, Ark.	97,569	11,495	8,210	1,653	506	58,571	20,412
At Vicksburg, Miss., to Delta Point, La	96,011	21,915	118	862	742	177,411	17,324
At Natchez, Miss.; Angola, La.; Bayou Sara, La.; Baton Rouge, La.; and Donaldsonville, La	377,198	66,193	51,002	11,430	2,617	113,443	116,128
At New Orleans, La	4,245,966	191,782	95,710	52,718	27,646	245,774	551,029

TABLE No 4.—*Ferry traffic—Freight carried*—Continued.

Location of ferries and transfers.	Logs.	Iron, steel, and metals.	Groceries and provisions.	Oil.	Stone, gravel, and sand.	Unclassified and miscellaneous.	Total
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
At St. Louis, Mo	16,916	253,996	190,852	88,646	754,480	1,717,670	7,279,601
At Chester, Ill.; Moro, Ill.; Commerce, Mo	....	183	5,794	....	360,524	52,155	720,035
At Cairo, Ill., to Birds Point, Mo., Greenfield, Mo., and Wickliffe, Ky.; at Belmont, Mo., to Columbus, Ky.; at Cottonwood Point, Mo., and Nebraska Landing, Tenn	290	3,127	8,358	98	100	47,463	88,018
At Memphis, Tenn., to Hopefield and Mound City, Ark	10,181	7,498	39,485	1,803	444,000	120,343	803,615
At Hales Point, Tenn.; Helena, Ark.; and Arkansas City, Ark.	7,001	3,360	2,419	940	962	39,397	154,926
At Vicksburg, Miss., to Delta Point, La	75	37,014	1,211	6,802	1,378	438,142	702,904
At Natches, Miss.; Angola, La.; Bayou Sara, La.; Baton Rouge, La.; and Donaldsonville, La.	17,344	32,049	62,799	74,938	541,321	188,824	1,278,098
At New Orleans, La	7,108	174,760	466,639	28,326	101,218	970,568	2,913,278

Transfer of empty cars not included in tonnage at railroad transfer points.

Owing to deficiency and inaccessibility of the records of some transportation companies, considerable tonnage, which should appear under classified heads above, had to be included in "Miscellaneous and unclassified."

Statement of maps and charts issued and sold from July 1, 1910, to June 30, 1911—Improving Mississippi River, Mississippi River Commission, secretary's office.

Description.	Free issue.	Sold.	Total.
Sheets Mississippi River, scale 1:20,000	1,597	532	2,129
Sheets Mississippi River, scale 1:10,000	343	94	437
Sheets lower Mississippi River, scale 1 inch=1 mile	692	810	1,502
Sheets upper Mississippi River, scale 1 inch=1 mile	377	442	819
Sets upper alluvial valley (4 sheets each)	45	29	74
Sheets upper alluvial valley	5	2	7
Sets lower alluvial valley (8 sheets each)	58	47	105
Sheets lower alluvial valley	9	39	48
Sets harbor New Orleans, scale 1 : 10,000 (4 sheets each)	6	6	12
Sheets district map of lower Mississippi River	6	5	11
Sheets Lake Itasca Basin	9	8	17
Sets St. Francis Basin (2 sheets each)	10	2	12
Sheets St. Francis Basin	....	3	3
Total	3,157	2,019	5,176

Proceeds deposited to the credit of the Treasurer of the United States, $351.99.

TABLE No. 1.—*Highest and lowest gauge readings of 1910.*

MISSISSIPPI RIVER.

Station.	Distance from Cairo.	Elevation of gauge zero above mean Gulf level.	Highest.					Lowest.				
			Prior to 1910.		1910.		Difference compared with previous highest.	Prior to 1910.		1910.		Difference compared with previous lowest.
			Date.	Gauge reading.	Date.	Gauge reading.		Date.	Gauge reading.	Date.	Gauge reading.	
	Miles above.	*Feet.*		*Feet.*		*Feet.*	*Feet.*		*Feet*		*Feet.*	*Feet.*
Aitkin, Minn	1,090.0	1,186.35	July 6-8, 1905	16.36	Mar. 25	8.10	− 8.26	July 29, 1902	1.3	Oct. 24	1.50	+0.20
St. Paul, Minn	874.0	684.14	Apr. 29, 1881	19.7	Mar. 19, 21	10.6	− 9.1	Mar. 19, 20.22, 1896	− .9	Nov. 19	− .3	+ .6
Hastings, Minn	849.0	670.36	Apr. 30, 1881	18.00	Mar. 23, 24	10.7	− 7.30	Nov. 23, 1892	− .70	Nov. 30	− .6	+ .10
Winona, Minn	760.0	639.90	June 18, 1880	16.87	Mar. 26, 27	8.8	− 8.07	Dec. 30, 1889	−1.33	Dec. 1	.0	+1.33
Prairie du Chien, Wis.	668.0	605.16	June 22, 1880	21.30	Mar. 31	8.8	−12.50	1864	− .2	Aug. 5-12	.1	+ .3
Rock Island, Ill	510.7	541.94	June 27, 1892	19.4	Jan. 1	11.90	− 7.5	Jan. 5, 6, 1890	− .9	Dec. 5	−1.15	− .25
Burlington, Iowa	427.6	510.82	May 18, 19, 1888 June 30, 1892	17.6	Mar. 22	8.35	− 9.25	Dec. 4, 5, 1895	−1.1	Dec. 10	−1.25	− .15
Nashville, Iowa	393.6	496.43	May 17, 18, 1888	12.0	Jan. 7	8.00	− 4.0	Jan. 7, 1890	− .5	do	− .30	+ .2
Hannibal, Mo	329.4	448.97	June 8, 1903	22.5	Mar. 20, 21	10.9	−11.6	Jan. 9, 1890	−1.75	Dec. 14	−1.8	− .05
Grafton, Ill	233.0	403.66	June 11, 1903	28.7	May 10	14.3	−14.4	Dec. 9, 1895	− .9	Dec. 14, 15	.6	+1.5
Alton, Ill	216.2	313.54	June 9, 1903	115.80	do	101.45	−14.35	Dec. 19, 1897 Jan. 28, 29, 1902	82.70	Dec. 26-28	84.00	+1.30
St. Louis, Mo	190.8	379.79	June 10, 1903	[1] 38.00	do	24.90	−13.10	Jan. 2, 1900	−2.52	Dec. 16	−1.45	+1.07
Chester, Ill	115.5	340.87	June 13, 14, 1903	33.3	May 11	22.2	−11.1	Jan. 3, 1900	−4.1	Dec. 17	− .8	+3.3
Grand Tower, Ill	85.0	321.74	June 14, 1903	33.80	do	24.4	− 9.4	Jan. 3-4, 1900	2.0	Dec. 17, 27	4.7	+2.7
Cape Girardeau, Mo	54.5	304.54	do	36.53	do	26.5	−10.03	Jan. 15, 1909	.6	Dec. 18	3.23	+2.63
Grays Point, Mo	48.0	300.85	June 14, 15, 1903	35.40	do	26.20	− 9.20	do	.2	do	2.55	+2.35
Cairo, Ill		270.41	Feb. 27, 1883	52.17	Mar. 15	42.15	−10.02	Dec. 24, 1871	−1.00	Nov. 14	5.12	+6.12
	Below.											
Columbus, Ky	21.6	266.46	Feb. 26, 1883	45.58	Mar. 15	39.52	− 6.06	Nov. 6-8, 1895	.05	Nov. 25	5.50	+5.45
Morrissons Landing, Mo.[2]	69.0	256.04	Feb. 24, 1884	41.50				Nov. 11-14, 1879	− .17			
New Madrid, Mo	70.3	255.96	Mar. 29, 1897	40.27	Mar. 15	34.34	− 5.93	Nov. 6-8, 1895	.55	Nov. 26	4.42	+3.87
Cottonwood Point, Mo.	122.5	230.50	Mar. 19, 1903	39.96	Mar. 16, 17	32.76	− 7.20	Nov. 5-8, 1895	−3.35	do	.22	+3.57

[1] High water of June 28, 1844, would read 41.4 feet.

[2] Gauge transferred to New Madrid in 1898.

TABLE No. 1.—*Highest and lowest gauge readings of 1910*—Continued.

MISSISSIPPI RIVER—Continued.

Station.	Distance from Cairo.	Elevation of gauge zero above mean Gulf level.	Highest.					Lowest.				
			Prior to 1910.		1910.		Difference compared with previous highest.	Prior to 1910.		1910.		Difference compared with previous lowest.
			Date.	Gauge reading.	Date.	Gauge reading.		Date.	Gauge reading.	Date.	Gauge reading.	
	Miles below.	*Feet.*		*Feet.*		*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Fulton, Tenn.	175.4	208.74	Mar. 19, 1903	40.15	Mar. 17	30.00	−10.15	Nov. 7, 8, 1895	.16	Nov. 27	2.86	+2.70
Memphis, Tenn.	230.0	184.19	Feb. 3, 1907	40.30	Mar. 19	33.12	− 7.18	Nov. 6–9, 1895	−2.65	Nov. 28	3.15	+5.80
Mhoon Landing, Miss.	276.3	161.35	Feb. 4, 5, 1907	42.20	Mar. 19–20	35.8	− 6.4	Nov. 6–11, 1895	−7.80	Nov. 17–20, 26, 28, 29.	−1.9	+5.90
Helena, Ark.	306.5	141.81	Apr. 4, 1897	51.75	Mar. 21	40.70	−11.05	Nov. 8, 9, 1895	−3.00	Nov. 29, 30	3.23	+6.23
Sunflower Landing, Miss.	352.7	127.25	Mar. 27, 28, 1903	48.00	Mar. 21, 22	39.00	− 9.0	Nov. 12–14, 1895	−1.50	Nov. 29–Dec. 1	4.75	+6.25
Mouth White River, Ark.	393.2	108.86	Mar. 28, 29, 1903	53.70	Mar. 23	44.45	− 9.25	Dec. 28, 1872	.00	Nov. 30, Dec. 1	7.80	+7.80
Arkansas City, Ark.	438.3	96.75	Mar. 27, 28, 1903	52.9	do	43.13	− 9.77	Nov. 9, 10, 1895	−3.6	Dec. 1, 2	4.19	+7.79
Greenville, Miss.	478.3	88.53	Mar. 27, 1903	49.1	Mar. 23, 24	36.95	−12.15	Nov. 10, 11, 1895	−2.55	do	1.87	+4.42
Lake Providence, La.	542.3	69.77	do	46.48	Mar. 24, 25	36.90	− 9.58	Nov. 17, 1895	−5.30	do	.72	+6.02
Vicksburg, Miss.	599.3	46.16	Apr. 16, 1897	52.48	Mar. 25, 26	40.60	−11.88	Nov. 13, 14, 1895	−6.5	Dec. 3	1.37	+7.87
St. Joseph, La.	648.3	33.15	Mar. 28, 1903	48.07	Mar. 26, 27	36.30	−11.77	Nov. 13, 1895	−9.3	Dec. 3, 4	−3.75	+5.55
Natchez, Miss.	700.3	17.09	Mar. 28–30, Apr. 2, 1903.	50.35	Mar. 26–28	39.8	−10.55	Nov. 13–15, 1895	− .85	Dec. 3–5	4.0	+4.85
Red River Landing, La.	765.3	3.57	May 14, 15, 1897	50.20	Mar. 28	38.50	−11.70	Nov. 14, 1895	− .60	Dec. 3	3.67	+4.27
Bayou Sara, La.	799.8	4.15	May 13–15, 1897	43.7	Mar. 27–29	31.6	−12.1	Nov. 16, 1895	−2.8	do	− .6	+2.2
Baton Rouge, La.	833.3	− .42	do	40.65	Mar. 28	29.50	−11.15	Nov. 14, 1894	.45	Dec. 2	2.00	+1.55
Plaquemine, La.	854.1	.44	May 13–17, 1897	36.25	Mar. 27, 28	25.52	−10.73	do	− .94	Dec. 2, 3	.52	+1.46
Donaldsonville, La.	885.4	− 1.01	May 13, 1897	32.75	Mar. 28	23.00	− 9.75	Nov. 11, 1894	1.00	Dec. 2	1.25	+ .25
College Point, La.	904.5	.29	May 15, 1897	27.95	Mar. 27, 28	19.40	− 8.55	Nov. 14, 1894	− .91	Dec. 2, 6	− .35	+ .56
Carrollton, La.	960.5	− .13	Mar. 29, 1903 Apr. 5, 6, 1903	19.42	Mar. 29, 30	12.85	− 6.57	Dec. 27, 1872	−1.60	Dec. 6, 7	− .30	+1.30
Algiers, La.	966.0	− 2.64	Mar. 25, 26, 29, 1903.	19.9	do	14.35	− 5.55	Dec. 20, 28, 1904	2.0	Dec. 6	1.95	− .05
Fort Jackson, La.	1,039.0	− 1.68	Feb. 13, 14, 16, 18, 19, 21, 1907.	8.3	Mar. 31, Apr. 2, 3.	6.24	− 2.06	Nov. 12, 14, 1894 Dec. 7, 1893	.3	Dec. 3	.7	+ .4

TRIBUTARIES OF MISSISSIPPI RIVER AND THE ATCHAFALAYA.

River.	Station.	Approximate distance of station from—		Elevation of gauge zero above mean Gulf level.	Highest.					Lowest.				
					Prior to 1910.		1910.		Difference compared with previous highest.	Prior to 1910.		1910.		Difference compared with previous lowest.
					Date.	Gauge reading.	Date.	Gauge reading.		Date.	Gauge reading.	Date.	Gauge reading.	
			Miles.	*Feet.*		*Feet.*		*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Arkansas	Little Rock, Ark.	Mouth	176	222.06	May 21, 1892	31.20	May 25	15.73	−15.47	Oct. 22–25, 1909	1.40	Dec. 10, 18–22	0.48	−0.92
Do[1]	Pine Bluff, Ark.	Mouth	110	180.78	May 22, 1892	30.50				Nov. 20–23, 1887	− .40			
Atchafalaya	Barbre Landing, La.	Head	0	3.88	May 13, 14, 1897	50.95	Mar. 28–30	35.37	−15.58	Oct. 26, 1897	−1.77	Dec. 3	2.15	+3.92
Do.[2]	Simmesport, La.	Head	5	5.79	May, 1897	47.32	Mar. 26–30	32.16	−15.16	Nov. 8, 1891	−3.5	Dec. 3, 4	.1	+3.6
Do.	Melville, La.	Head	31	.44	June 22, 23, 1908	39.7	Mar. 29, 30	32.14	− 7.56	Nov. 12, 13, 1894	1.0	Dec. 4–6	4.78	+3.78
Cumberland	Nashville, Tenn.	Cairo	248		Jan. 22, 1882	55.30	Feb. 22	35.00	−20.30	Oct. 15, 16, 1878	− .40	Nov. 17, 20–26	7.20	+7.60
Illinois	Peoria, Ill	Mouth	160	428.52	Mar. 28, 29, 1904	23.00	Mar. 12–14	17.3	− 5.70	Oct. 7, 1890	2.6	Aug. 26, Dec. 14.	8.1	+5.5
Do.[1]	Beardstown, Ill.	Mouth	86	423.86	1882	21.3				Aug. 11, 12, 1887	.00			
Missouri	Kansas City, Mo.	Mouth	388	716.93	June 1, 2, 1903.	[3]35.0	Mar. 24	20.2	−14.8	Dec. 2, 1874[4]	1.5	Dec. 11	1.6	+ .1
Do.[1]	Coles Creek, Mo.	Mouth	107	413.54	May 15, 1892	96.76				Dec. 24, 1897	70.7			
Do	Hermann, Mo.	Mouth	103	481.74	June 6, 1903	[5]29.5	June 11	20.3	− 9.2	Dec. 21, 22, 1878	− .75	Dec. 18–23	1.7	+2.45
Do.	St. Charles, Mo.	Mouth	28	413.53	June 8, 1903	[6]33.95	do	24.60	− 9.35	Dec. 26, 1879	3.53	Dec. 18	6.70	+3.17
Ohio	Cincinnati, Ohio	Cairo	498	429.25	Feb. 14, 1884	71.06	Mar. 7	51.8	−19.26	Sept. 18, 1881	1.92	Aug. 28–Sept. 1.	4.0	+2.08
Do.	Louisville (upper), Ky.	Cairo	364	403.00	Feb. 16, 1884	46.60	Jan. 18[7]	27.5	−19.10	Sept. 10–14, 18–22, 1881. Nov. 14–16, 1895	1.70	Jan. 2, 4[8]	3.0	+1.30
Do.	Louisville (lower), Ky.	Cairo	364	376.06	do	72.00	do.[7]	54.0	−18.00	Oct. 17, 18, 1872	1.60	Oct. 30, 31	4.3	+2.7
Do.	Evansville, Ind.	Cairo	182	329.18	Feb. 19, 1884	48.8	Mar. 10	39.7	− 9.1	Nov. 7, 8, 1895	− .3	Nov. 4	3.4	+3.7
Do.	Paducah, Ky.	Cairo	45	286.26	Feb. 23, 1884	54.25	Mar. 11–13	36.2	−18.05	Oct. 30–Nov. 4, 1895	− .7	Nov. 8	2.4	+3.1
Do.	Cairo, Ill.	Cairo	0	270.41	Feb. 27, 1883	52.17	Mar. 15	42.15	−10.02	Dec. 24, 1871	−1.00	Nov. 14	5.12	+6.12
Ouachita	Camden, Ark.	Mo. Red Riv	325	71.10	May 12, 1882	46.0	Apr. 17	33.10	−12.9	Aug. 29, 30, 1887	1.80	Nov. 24–27	3.00	+1.20
Do.	Monroe, La.	Mo. Red Riv	175	30.97	1874	49.1	May 2	28.7	−20.4	Sept. 13–20, 1909	−1.8	Nov. 5	.1	+1.9
Red	Fulton, Ark.	Mouth	508	224.48	July 17, 1876	35.75	Apr. 19	22.53	−13.22	Oct. 20–22, 1896	.10	Nov. 24–26	3.08	+2.98
Do.[1]	Garland, Ark.	Mouth	450	203.16	Mar. 24, 1894	28.50				Sept. 22–25, 1896	− .20			
Do	Shreveport, La.	Mouth	320	140.99	May 28, 1892	35.70	Apr. 21	13.86	−21.84	Dec. 2–4, 1894	−5.50	Dec. 19	−5.0	+ .5
Do.	Alexandria, La.	Mouth	110	44.18	July 6, 1908	41.84	Apr. 23	22.38	−19.46	Sept. 29, 1881	−3.7	Dec. 7–9	−2.0	+1.7

[1] Discontinued.

[2] Record from May, 1892, to Dec., 1905, in part only.

[3] High water of June, 1844—37 feet.

[4] January 6 gauge read −0.1; probably affected by ice.

[5] High water of June, 1844, would read 35.6 feet.

[6] High water of June, 1844—39.57 feet.

[7] Ice gorged.

[8] Lowest reading during low-water season, 1910, Dec. 26, 3.2 feet.

Table No. 1.—*Highest and lowest gauge readings of 1910.*

TRIBUTARIES OF MISSISSIPPI RIVER AND THE ATCHAFALAYA—Continued.

River.	Station.	Approximate distance of station from—	Elevation of gauge zero above mean Gulf level.	Highest.					Lowest.				
				Prior to 1910.		1910.		Difference compared with previous highest.	Prior to 1910.		1910.		Difference compared with previous lowest.
				Date.	Gauge reading.	Date.	Gauge reading.		Date.	Gauge reading.	Date.	Gauge reading.	
		Miles.	*Feet.*		*Feet.*		*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
St. Francis	Bridge St. L. I. M. & S. Ry.	Mouth..... 100	176.5	Apr. 4-6, 1897	41.6	Apr. 17, 18	15.86	−25.74	Nov. 3-11, 1901	− .05	Oct. 8, 4	2.68	+2.73
Do.[1]	Wittsburg, Ark	Mouth..... 86	....	Apr. 28, 1886	42.02	....	....	....	Oct. 27-31, Nov. 10-14, 1892.	−3.60	....	....	....
Tennessee	Chattanooga, Tenn	Cairo..... 509	617.81	Mar. 11, 1867	58.6	Feb. 20	13.9	−44.7	Sept. 11-14, 1881, & 19, 1883.	.00	Nov. 16-27	1.2	+1.2
Do	Florence, Ala	Cairo..... 301	400.85	Mar. 19, 1897	32.20	Feb. 22	11.67	−20.53	Oct., 1872, Sept. 18, 1878.	− .76	Nov. 18-27	− .14	+ .62
Do	Johnsonville, Tenn.	Cairo..... 141	315.89	1882	48.0	Feb. 23, 24	21.2	−26.8	Oct. 26-Nov. 4, 1904	− .9	Nov. 23-27	.7	+1.6
Wabash	Mount Carmel, Ill.	Cairo..... 202	373.0	Aug. 7. 1875	28.3	Mar. 9	21.9	− 6.4	Nov. 7-23, 1895	− .2	June 28, 29	1.4	+1.6
White	Jacksonport, Ark.	Mouth..... 360	....	Mar. 14, 1890	33.35	June 12	21.41	−11.94	Dec. 24, 1872	−1.10	Dec. 22	.75	+1.85
Do	Clarendon, Ark	Mouth..... 134	138.47	Mar. 20, 1890	36.63	Oct. 18	25.77	−10.86	Nov. 22, 1887	4.07	do	7.27	+3.20
Yazoo	Yazoo City, Miss	Mouth..... 65	78.61	1882	36.50	Aug. 1, 5	19.1	−17.40	1875	−4.30	Nov. 27, Dec. 2-9	−1.3	+3.00

[1] Discontinued.

TABLE No. 2.—*Maximum heights above mean Gulf level at high water and regular gauges on the Mississippi River from Cairo to the Passes during high water of 1911, with high water of 1903 for comparison.*

Designation of gauges.	Distance from Cairo.	Highest water, 1911.		Highest water of 1903 (elevation above mean Gulf level).	Difference between highest of 1911 and 1903.	Method of obtaining highest reading, 1911.
		Date.	Elevation above mean Gulf level.			
	Miles.		*Feet.*	*Feet.*	*Feet.*	
Cairo	0	Apr. 20-21	315.8	321.0	−5.2	
182	4.2	Apr. 21	314.7	318.8	−4.1	
181	8.8		312.6			Stain.
180	12.5		311.8	316.4	−4.6	Levee engineer.
179	17.8	Apr. 21	309.8	313.6	−3.8	
Columbus	21.6	do	308.3	311.0	−2.7	
178	27.5		305.9	309.1	−3.2	
177	33.5	Apr. 21	304.6	306.9	−2.3	
176	38.5		301.8	304.6	−2.8	
175	44.2		300.2	302.3	−2.1	Stain.
174	49.8	Apr. 22	298.4	300.4	−2.0	
173	54.0		297.5	298.9	−1.4	Do.
172	59.5		296.5	299.0	−2.5	
171	64.5					
New Madrid	70.3	Apr. 22	292.3	295.5	−3.2	
170	74.0		290.4			
109	77.5		288.1	290.4	−2.3	Do.
168	84.0	Apr. 23	284.7	288.6	−3.9	
167	89.5	Apr. 22-24	281.5	285.7	−4.2	
106	95.0		278.4	282.4	−4.0	
165	99.2		276.2	280.8	−4.6	
164	103.8		274.4	279.3	−4.9	Do.
163	109.2		271.6	276.4	−4.8	
162	113.5	Apr. 22-23	269.8	274.4	−4.6	
161	118.5		266.9	272.2	−5.3	Do.
Cottonwood Point	122.5	Apr. 23	265.2	270.5	−5.3	
160	127.8	do	263.6	269.3	−5.7	
159	130.5	do	261.8			
158	135.0		260.8	266.7	−5.9	
157	139.8		257.3	264.8	−7.5	Do.
156	146.0		254.9			
155	152.8	Apr. 24	251.5	258.3	−6.8	
154	158.2	do	249.5	255.8	−6.3	
153	161.8		248.1	254.9	−6.8	
152	167.5		245.3			Do.
151	172.0	Apr. 25	243.0			
Fulton	175.4	do	241.7	248.9	−7.2	
150	180.1		239.4	247.2	−7.8	
149	186.2	Apr. 25-26	237.2	243.6	−6.4	
148	192.2		235.2	241.0	−5.8	Do.
147	197.2		233.6	240.1	−6.5	Do.
146	203.0		231.4	237.2	−5.8	Do.
145	208.0		228.7			
144	212.8		227.0			Self-registering gauge.
143	220.2	Apr. 26	226.3	230.1	−3.8	
142	225.7					
Memphis	230.0	Apr. 25-26	220.6	224.3	−3.7	
141	235.0		217.8	221.8	−4.0	
140	239.5			218.8		
139	243.5		214.1	217.7	−3.6	
138	249.5			215.0		
137	256.2	Apr. 27	207.5	210.8	−3.3	
136	261.3	do	204.3	208.4	−4.1	
135	266.8	do	202.4	206.4	−4.0	
134	271.0			204.2		
Mhoon Landing	276.3	Apr. 26-28	199.6	203.2	−3.6	
133	280.5			202.3		
132	284.2		196.6	199.8	−3.2	Self-registering gauge.
131	289.5		192.4	198.7	−6.3	
130	293.5	Apr. 27-28	191.1	197.1	−6.0	
129	297.8	Apr. 28-29	189.9	196.7	−6.8	
128	301.5	Apr. 29	188.2	194.2	−6.0	
Helena	306.5	Apr. 28-29	186.4	192.8	−6.4	
127	312.5	Apr. 29	186.3	190.3	−4.0	
126	317.8		182.8	188.2	−5.4	
125	323.5	Apr. 29	180.9	186.3	−5.4	
124	329.2		178.7	183.5	−4.8	
123	334.5	Apr. 29	177.0	181.7	−4.7	
122	339.0	do	175.3	179.1	−3.8	
121	342.5		173.3	178.1	−4.8	
120	346.8		171.0	176.7	−5.7	

NOTE.—When not otherwise stated, the high-water readings were taken on the gauges.

TABLE No. 2.—*Maximum heights above mean Gulf level at high water and regular gauges on the Mississippi River from Cairo to the Passes during high water of 1911, with high water of 1903 for comparison*—Continued.

Designation of gauges.	Distance from Cairo.	Highest water, 1911.		Highest water of 1903 (elevation above mean Gulf level).	Difference between highest of 1911 and 1903.	Method of obtaining highest reading, 1911.
		Date.	Elevation above mean Gulf level.			
	Miles.		*Feet.*	*Feet.*	*Feet.*	
Sunflower Landing	352.7	Apr. 29–30	169.9	175.2	−5.3	
119	357.0	Apr. 29	167.6	173.4	−5.8	
118	362.0		167.0	172.4	−5.4	
117	366.8	Apr. 30	165.0	170.9	−5.9	
116	372.5		163.4	169.9	−6.5	Stain.
115	378.0	May 1	161.3	167.2	−5.9	
114	383.5	do	159.5	165.1	−5.6	
113	389.5		158.2	164.4	−6.2	
Mouth of White River	393.2	May 1–2	157.2	162.6	−5.4	
112	398.5	May 1	155.8	161.1	−5.3	
111	401.8		155.2	159.9	−4.7	
110	408.0	May 2	153.8	158.3	−4.5	
109	411.5		152.3	157.5	−5.2	
108	416.8	May 2	151.6	156.9	−5.3	
107	421.5			155.8		
106	427.0	May 2	148.5	154.4	−5.9	
105	432.5		146.2	151.4	−5.2	
Arkansas City	438.3	May 2–3	144.8	149.6	−4.8	
104	444.8			147.0		
103	449.5	May 1	141.9	146.3	−4.4	
102	454.0		137.8	143.3	−5.5	Do.
101	460.0	May 2–3	136.9	143.0	−6.1	
100	463.5		136.5	142.1	−5.6	Do.
99	467.5	May 3	136.1	141.3	−5.2	
98	473.5		133.0	139.4	−6.4	
Greenville	478.3	May 3	130.2	137.6	−7.4	
97	482.5		129.3	137.1	−7.8	Do.
96	487.0	May 3	128.5	135.6	−7.1	
95	490.0	May 3, 4	127.6	134.6	−7.0	
94	495.3	do	125.3	133.0	−7.7	
93	501.0			130.8		
92	505.5	May 4	122.3	129.2	−6.9	
91	510.8	do	120.0	126.4	−6.4	
90	517.0		118.8	124.5	−5.7	Do.
89	522.5	May 3, 4	117.2	123.5	−6.3	
88	525.8		115.3	121.7	−6.4	Do.
87	531.5		113.5	119.7	−6.2	Do.
86	537.5	May 4	112.4	117.6	−5.2	
Lake Providence	542.3	do	111.3	116.2	−4.9	
85	546.8	do	110.5	115.7	−5.2	
84	552.0		107.6	114.0	−6.4	Do.
83	557.5		106.6	112.2	−5.6	Do.
82	561.5		104.8	110.0	−5.2	Self-registering gauge.
81	568.0					
80	573.5		98.7	105.2	−6.5	Stain.
79	578.0		97.7	103.9	−6.2	Do.
78	583.0			102.8		
77	588.5		94.7	101.0	−6.3	Self-registering gauge.
76	593.5			99.5		
Vicksburg	599.3	May 6	91.3	98.0	−6.7	
75	602.8	May 5–7	89.9	96.5	−6.6	
74	607.5	May 7	88.0	94.2	−6.2	
73	612.5	May 6	85.9	91.8	−5.9	
72	617.5	May 7	84.2	90.0	−6.7	
71	622.0		82.5			
70[1]	629.0		79.7	88.0	−8.3	Stain.
69	633.0	May 7–8	79.1	86.9	−7.8	
68	638.0			84.0		
67	642.8	May 7–9	75.9	82.4	−6.5	
St. Joseph	648.3	May 7, 8	74.2	81.2	−6.8	
66	655.3		71.5	78.5	−7.0	Do.
65	659.8		70.1	77.3	−7.2	
64	663.8	May 10	69.0	76.4	−7.4	
63	681.0		68.2	75.3	−7.1	
62	685.5			74.1		
61	691.5		65.4	71.9	−6.5	Do.
60	694.0		64.0	70.1	−6.1	Do.

[1] When not otherwise stated, the high-water readings were taken on the gauges.

Table No. 2.—*Maximum heights above mean Gulf level at high water and regular gauges on the Mississippi River from Cairo to the Passes during high water of 1911, with high water of 1903 for comparison*—Continued.

Designation of gauges.	Distance from Cairo.	Highest water, 1911.		Highest water of 1903 (elevation above mean Gulf level).	Difference between highest of 1911 and 1903.	Method of obtaining highest reading, 1911.
		Date.	Elevation above mean Gulf level.			
	Miles.		*Feet.*	*Feet.*	*Feet.*	
Natches	700.3	May 7-12	61.4	67.4	−6.0	
59	705.5	May 9-10	60.6	66.0	−5.4	Stain.
58	711.3	May 9	59.2	65.0	−5.8	Do.
57	716.0		59.5?	64.8	−5.3	Do.
56	720.5	May 10	57.1	63.0	−5.9	
55	725.3		56.4	62.0	−5.6	Do.
54	730.5			59.8		
53	737.5			58.5		
52	742.8	May 10	50.9	57.7	−6.8	
51	747.0		51.0?	56.7	−5.7	
50	751.5		48.9	55.8	−6.9	Do.
49	756.0	May 12	47.2	55.0	−7.8	
48	761.0			54.4		
Red River Landing	765.3	May 12	46.2	53.6	−7.4	
47	769.0		44.6	53.2	−8.6	
46	772.5		45.1?	52.9	−7.8	Do.
45	779.8		42.8	51.1	−8.3	
44	784.8		41.2?	50.2	−9.0	Do.
43	790.0		41.4	49.0	−7.6	Do.
42	794.5	May 12-13	40.6	48.0	−7.4	
Bayou Sara	799.8	May 10-14	39.2	47.5	−8.4	
41	803.5	May 12	37.9	46.0	−8.1	
40	808.0	May 13	37.2	45.7	−8.5	
39	812.5	May 11-13	37.2?	44.2	−7.0	
38	817.0		34.6	43.0	−8.4	Do.
37	822.5		34.7	42.8	−8.1	
36	828.5	May 12-13	32.6	40.5	−7.9	
Baton Rouge	833.3	May 13-16	32.0	39.6	−7.6	
35	839.5	May 12-13	31.1	38.8	−7.7	
34	844.3		29.9	37.9	−8.0	
33	850.0		29.2	36.9	−7.7	
Plaquemine	854.1	May 13	28.8	36.6	−7.8	
32	859.8	May 12	27.4	35.2	−7.8	
31	864.5		26.8	34.6	−7.8	
30	870.0		26.1	33.3	−7.2	
29	874.5		25.6	32.5	−6.9	Do.
28	880.0		25.1	31.9	−6.8	Do.
Donaldsonville	885.4	May 12-13	24.4	31.2	−6.8	
27	889.8			30.6		
26	895.8	May 13	23.3	29.8	−6.5	
25	900.3	May 12	22.4	28.5	−6.1	
College Point	904.5	May 15	21.8	28.1	−6.3	
24	910.5		20.9	27.0	−6.1	Do.
23	914.8	May 14-15	20.5	26.3	−5.8	
22	919.8	May 12-13	19.8	25.6	−5.8	
21	925.5	May 11	18.3	24.6	−6.3	
20	930.0		17.6	23.3	−5.7	
19	934.3		17.0	23.0	−6.0	Do.
18	937.8		16.7	22.1	−5.4	Do.
17	943.5		16.2	21.5	−5.3	
16	947.3	May 14-15	15.7	21.0	−5.3	
15	953.0		14.8	19.8	−5.0	Do.
Carrollton	960.5	May 15	14.4	19.3	−4.9	
Algiers	966.0	May 11, 13-16	13.2	17.3	−4.1	
14	968.0	May 16-17	12.8	16.9	−4.1	
13	973.5					
12	979.3	May 17	11.6	15.0	−3.4	
11	983.5		10.9	14.2	−3.3	Do.
10	989.3	May 15	10.0	13.3	−3.3	
9	993.0	May 16	9.5	12.4	−2.9	
8	999.0	do	9.0	11.8	−2.8	
7	1,003.8		8.8	11.3	−2.5	Do.
6	1,008.3	May 13	9.0	10.3	−1.3	
5	1,013.0		8.5	10.1	−1.6	
4	1,019.0	May 14	7.6	9.2	−1.6	
3	1,023.8	May 15	7.5	9.0	−1.5	
2	1,029.0	do	6.7	8.0	−1.3	
1	1,034.0	May 17	5.9	7.0	−1.1	
Fort Jackson	1,039.0	May 15-18	5.3	6.4	−1.1	
A	1,045.3	May 15	5.0			
B	1,049.5	May 16	4.9			
C	1,055.2	May 17	4.0			

TABLE No. 3.—*Cost of dredging operations May 1, 1910, to April 30, 1911.*

Class of work, or plant to which distributed.	Labor.	Office supplies.	Subsistence.	Fuel.	Lighting supplies.	Lubricants.	Material.	Permanent plant and outfit.	Repairs (nonpersonal service and materials).	Total.	Grand total.
Care of plant	$36,915.21	$131.57	$8,147.19	$13,315.47	$154.80	$245.10	$274.02			$59,183.36	$59,183.36
Repairs to floating plant:											
Dredge Beta	2,467.74		595.99		2.07	97.23	960.87			4,123.90	
Dredge Gamma	5,199.99		1,186.17	109.56	11.17	128.66	8,395.03		$61.30	15,091.88	
Dredge Delta	2,299.83		590.84		2.30	8.17	521.86			3,423.00	
Dredge Epsilon	1,049.05		256.43		.47	7.16	227.71			1,540.82	
Dredge Zeta	1,038.00		250.49		.47	6.17	301.90			1,597.03	
Dredge Iota	3,392.88		888.24		1.68	56.30	493.11			4,832.21	
Dredge Kappa	2,503.52		584.82		3.40	37.78	528.82			3,658.34	
Dredge Henry Flad	3,895.91		897.20		8.57	60.31	467.03			5,329.02	
Dredge B. M. Harrod	1,950.75		492.85		3.39	37.44	444.81			2,929.24	
Steamer Sachem	1,214.40		305.79		2.48	11.74	586.67			2,121.08	
Steamer Choctaw	2,666.74		647.64		5.78	47.23	735.99			4,103.38	
Steamer Nokomis	1,739.13		404.16		8.60	32.86	703.07			2,887.82	
Steamer Wynoka	1,502.18		351.13		4.61	4.03	320.47			2,182.42	
Steamer Leota	2,287.04		541.01	.08	7.98	6.37	744.08		11.40	3,597.96	
Steamer Search	1,582.58		338.72		1.68	5.37	331.61			2,259.96	
Steamer Vulcan	961.60		234.15		.90	4.87	151.03		23.75	1,376.30	
Steamer Venus	1,218.37		309.37		.73	6.98	318.49			1,853.94	
Steamer Mars	1,003.14		244.52		.91	3.78	233.35			1,485.70	
Steamer Mercury	457.82		93.76		.43	6.78	157.90			716.69	
Pile Sinker No. 13	32.08		11.70				4.17			47.95	
Pile Sinker No. 971	133.82		28.49			3.40	46.97			212.68	
Pile Sinker No. 981	477.65		110.47		.28	6.43	153.52			748.35	
Pile Sinker No. 982	1,034.92		151.76		.21	10.92	289.13			1,486.94	
Pile Sinker No. 983	703.54		120.12		.11	3.69	251.01			1,078.47	
Barge No. 041	151.45		19.81		.11		16.37			187.74	
Barge No. 061	184.92		27.09				24.49			236.50	
Pump boat	592.40		109.42		.21	.42	113.33			815.78	
Skiffs	20.30		3.00				5.26			28.56	
Sectional docks	175.71		27.80				15.49			219.00	
Total	41,937.46		9,822.94	109.64	68.54	594.09	17,543.54		96.45	70,172.66	70,172.66

Operations during low-water season, 1910:											
Dredge Gamma	8,580.21	20.65	3,124.07	5,145.78	51.77	212.97	264.56			17,400.01	
Dredge Epsilon	11,259.07	18.19	3,583.36	7,218.14	60.15	314.71	178.01			22,631.63	
Dredge Zeta	4,711.76	10.51	1,391.62	2,672.94	6.69	148.70	67.27			9,009.49	
Dredge Iota	9,646.73	9.19	3,251.73	4,779.72	64.00	206.70	165.00			18,123.07	
Dredge Kappa	9,931.33	7.89	3,362.08	6,629.58	43.15	238.69	261.59			20,474.31	
Dredge Henry Flad	9,570.10	10.06	3,038.71	3,893.48	27.76	211.83	152.21			16,904.15	
Dredge B. M. Harrod	10,996.57	11.10	3,189.03	6,668.13	37.11	207.53	224.14			21,333.61	
Steamer Search	8,147.98	79.40	1,882.72	2,235.69	18.80	41.66	22.41			12,428.66	
Steamer Vulcan	2,810.83	43.30	839.37	679.18	16.63	9.67	25.93			4,424.91	
Steamer Venus	3,253.48	39.10	1,014.31	708.56	25.97	63.45	50.12			5,154.99	
Steamer Mars	2,133.95	19.00	605.63	561.85	18.56	39.94	18.94			3,397.87	
Steamer Mercury	2,593.92	28.36	692.10	510.72	12.82	15.71	24.65			3,878.28	
Total	83,635.93	296.75	25,974.73	41,703.77	383.41	1,711.56	1,454.83			155,160.98	155,160.98
Construction of side-haul railway dry dock	441.14		127.28		.96	35.10	269.29	92,266.40			93,140.17
Engine house and shed for side-haul railway dry dock, construction of	334.97		45.60				27.54				408.11
Permanent outfit								7,064.16			7,064.16
Buildings and grounds	2,272.56		517.10		3.11	64.37	322.23				3,179.37
Miscellaneous:											
Motor skiffs, construction of	56.37		14.29				547.50			618.16	
Buoys, construction of	240.56		52.39				15.94			308.89	
Testing oils	17.84		4.65		3.72	.04	.02			26.27	
Testing anchors	39.34		9.97							49.31	
Handling materials	477.19		132.84							610.03	
Total	831.30		214.14		3.72	.04	563.46			1,612.66	1,612.66
Repairs to tools and appliances	1,483.00		386.57			.81	106.55			1,976.93	
Repairs to outfit	18.56		5.52			.04	83.46			107.58	
Total	1,501.56		392.09			.85	190.01			2,084.51	2,084.51
Gardening	78.09		25.10								103.19
Total cost of dredging operations	167,948.22	428.32	45,266.17	55,128.88	614.54	2,651.11	20,644.92	99,330.56	96.45		392,109.17

Table 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910.*

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Aug. 8 to Aug. 10.	Aug. 11.	Aug. 12 to Aug. 14.	Aug. 16 to Aug. 18.	Aug. 19.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet*
Cairo gauge	0	15.9 to 13.5	13.1	12.6 to 11.8	10.8 to 9.6	9.4
Medleys	31					
Lesters	55					
Slough	60					
Head of Island No. 10	63					
Kentucky Point	67					
Morrissons	69					
New Madrid gauge	70	13.8 to 12.0	11.5	11.0 to 10.3	9.6 to 8.6	8.4
Toneys	76					
Nolans	76					
Upper Point Pleasant	80				9	
Darnells	82					
Linda	83				12	
Cherokee	89				11½	
Joe Eckles	92					
Bass	93				17	
Island No. 14 or Reelfoot	99	9		[1] 9½	9	
Frits	101	11		9	9	
Hathaway	104	24		17	15	
Foot of Island No. 16	120					
Cottonwood Point gauge	123	11.2 to 9.4	8.9	8.2 to 7.1	6.5 to 5.4	5.1
Foot of Island No. 21	131			16		
Wrights Point	134	24		22		
Hales Point	136			16	16	
River Styx	139			11½	13	
Forked Deer	146			14	15	
O'Donnells	149			11½	12	
Fletchers towhead	157					
Gold Dust or Round Lake	158	16		16		
Chute of Island 30 (upper)	158	10		[2] 9	([3])	
Chute of Island 30 (middle)	158½					
Chute of Island 30 (lower)	159			16		
New Haven	163					
Plum Point	165	18				
Foot of Bullerton	168	13½		11	10	
Fulton gauge	175	11.4 to 10.2	9.8	9.2 to 8.4	7.8 to 6.9	6.
Hatchie River	178					
Island No. 34	180	17		14	12	
Morgans Point	181	20		14		
Island No. 35	194	9		[1] 9½	10	
Pecan Point	196	17½		15		
Walts	201	15½	13	13½	9	
Corona	204	18	17½	17½		
Old River	208	16		14	13	
Island No. 40	220	23				
Loosa Hatchee or Arthur	223	21				
Memphis gauge	230	12.9 to 11.6	11.2	10.5 to 9.4	9.0 to 8.2	7.8
Nonconnah	235					9
Wyanoke	238					([4])
Foot of Presidents Island	239					
Armstrong or Pattons	240					

[1] Dredged channel.

[2] From survey.

[3] 7½ feet was found; 2 dredges were in the channel.

[4] 7½ feet was found, but was not controlling depth.

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Aug. 8 to Aug. 10.	Aug. 11.	Aug. 12 to Aug. 14.	Aug. 16 to Aug. 18.	Aug. 19.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Head of Josie Harry Chute	243					
Horn Lake	244					12
Daisy	252					9
Star	259					
Head of McCulloughs towhead	269					
Peters	271					
Foxburns	275					
Mhoon Landing gauge	276	11.7 to 10.1	9.8	8.9 to 7.0	6.2 to 5.1	4.7
Hardins Point	287					
Helena gauge	306	16.3 to 14.5	14.0	13.1 to 11.2	10.4 to 9.4	8.9
Montezuma	313					
Friars Point	319					
Ledbetters	327					
Head of Island No. 63	330					
Sunflower Landing gauge	353	16.9 to 15.2	14.8	14.2 to 12.4	11.5 to 10.6	10.2
Andersons	359					
Towhead of Island No. 68	363					
Parkers	367					
Mouth of White River gaug	393	22.8 to 21.0	20.6	19.6 to 17.9	16.8 to 15.8	15.7
Indian Point	406					
Jersey Point	420					
Catfish Point	422					
Arkansas City gauge	438					
Moss Lake	455					
Salona	476					
Greenville gauge	478					
Refuge	484					
Longwood, Miss	501					
Grand Lake towhead	512					
Head of Louisiana bend	517					
Ashton	519					
Wilsons Point	532					
Lake Providence gauge	542					
Salem	564					
Hendersons	573					
Youngs Point	597					
Vicksburg gauge	599					

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Aug. 22 to Aug. 24.	Aug. 25 to Aug. 28.	Aug. 29 to Aug. 31.	Sept. 4 to Sept. 5.	Sept. 7 to Sept. 10.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo gauge		8.2 to 9.0	9.4 to 11.8	11.6 to 9.9	8.3 to 7.9	11.0 to 20.7
Medleys	31					
Lesters	55					
Slough	60					
Head of Island No. 10	63					
Kentucky Point	67					
Morrissons	69					
New Madrid gauge	70	7.6 to 7.8	8.0 to 10.1	10.0 to 9.0	7.5 to 7.0	8.0 to 16.7
Toneys	76					
Nolans	76					
Upper Point Pleasant	80	(1)		10	9	
Darnells	82					
Linda	83	12				
Cherokee	89	11				
Joe Eckles	92			17		
Bass	93					
Island No. 14 or Reelfoot	99	(2)				
Fritz	101			10		
Hathaway	104					
Foot of Island No. 16	120					
Cottonwood Point gauge	123	4.2 to 3.9	4.0 to 6.2	6.4 to 5.8	4.0 to 3.5	3.4 to 12.2
Foot of Island No. 21	131				15	
Wrights Point	134					
Hales Point	136	14			11½	
River Styx	139	11			11½	
Forked Deer	146					
O'Donnells	149	11			10½	
Fletchers towhead	157					
Gold Dust or Round Lake	158					
Chute of Island 30 (upper)	158	[3] 10			9½	
Chute of Island 30 (middle)	158½					
Chute of Island 30 (lower)	159					
New Haven	163					
Plum Point	165					
Foot of Bullerton	168	[4] 8½		9	9	
Fulton gauge	175	6.1 to 5.7	5.9 to 7.3	7.4 to 7.4	5.9 to 5.6	5.4 to 10.8
Hatchie River	178					
Island No. 34	180	10		12	10	
Morgans Point	181	15			14	
Island No. 35	194	[3] 10		10	9½	
Pecan Point	196	13			14	
Walts	201	[5] 9½		10	12	
Corona	204	13½				
Old River	208	13			13	
Island No. 40	220					
Loosa Hatchee or Arthur	223					
Memphis gauge	230	7.2 to 6.6	6.6 to 7.8	8.1 to 8.3	7.0 to 6.6	6.2 to 10.4
Nonconnah	235					
Wyanoke	238					
Foot of Presidents Island	239		(6)			
Armstrong or Pattons	240					

[1] 8 feet was found, dredge at work.

[2] 7 feet was found, dredge at work.

[3] Dredged channel.

[4] 1 cast.

[5] From survey.

[6] 8 feet was found, but was not controlling depth.

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Aug. 22 to Aug. 24.	Aug. 25 to Aug. 28.	Aug. 29 to Aug. 31.	Sept. 4 to Sept. 5.	Sept. 7 to Sept. 10.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet*
Head of Josie Harry Chute	243					
Horn Lake	244					9
Daisy	252		9			9
Star	259		11			
Head of McCulloughs towhead	269		20			
Peters	271		9			9½
Foxburns	275		13			12
Mhoon Landing gauge	276	3.3 to 2.4	2.8 to 3.6	4.2 to 5.1	3.3 to 2.5	1.9 to 5.7
Hardins Point	287					16
Helena gauge	306	7.8 to 7.1	7.0 to 7.5	7.9 to 9.1	7.8 to 7.0	6.5 to 8.1
Montezuma	313		15			12
Friars Point	319					
Ledbetters	327		13			9
Head of Island No. 63	330		9			9
Sunflower Landing gauge	353	9.2 to 8.5	8.4 to 8.6	8.8 to 10.1	9.6 to 8.8	8.2 to 8.9
Andersons	359		13			12
Towhead of Island No. 68	363					
Parkers	367		12			13½
Mouth of White River gauge	393	14.7 to 14.0	13.8 to 13.5	13.8 to 14.9	14.2 to 13.3	12.4 to 12.2
Indian Point	406		12			11
Jersey Point	420					13½
Catfish Point	422					8
Arkansas City gauge	438				11.3 to 10.4	9.5 to 8.6
Moss Lake	455					
Salona	476					
Greenville gauge	478					
Refuge	484					
Longwood, Miss	501					
Grand Lake towhead	512					
Head of Louisiana Bend	517					
Ashton	519					
Wilsons Point	532					
Lake Providence gauge	542					
Salem	564					
Hendersons	573					
Youngs Point	597					
Vicksburg gauge	599					

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Sept. 11 to Sept. 12.	Sept. 19 to Sept. 21.	Sept. 26 to Sept. 27.	Oct. 2 to Oct. 4.	Oct. 5 to Oct. 7.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo gauge	0	21.2 to 21.1	13.6 to 11.8	10.1 to 11.3	13.1 to 12.5	12.2 to 21.6
Medleys	31					
Lesters	55					
Slough	60					
Head of Island No. 10	63					
Kentucky Point	67					
Morrissons	69					
New Madrid gauge	70	17.3 to 17.7	11.8 to 10.4	8.2 to 8.9	10.9 to 10.5	10.6 to 17.2
Toneys	76					
Nolans	76					
Upper Point Pleasant	80		14	10		
Darnells	82		12			
Linda	83					
Cherokee	89	24	16½			
Joe Eckles	92					
Bass	93					
Island No. 14 or Reelfoot	99					
Fritz	101	19	12	9		
Hathaway	104	28				18½
Foot of Island No. 16	120					
Cottonwood Point gauge	123	13.2 to 14.4	9.0 to 7.3	4.6 to 4.8	6.8 to 7.2	7.1 to 11.7
Foot of Island No. 21	131		19			
Wrights Point	134					
Hales Point	136		17½	13½		
River Styx	139	19½		11		
Forked Deer	146		16	14		
O'Donnells	149	18½	14	10		
Fletchers towhead	157					
Gold Dust or Round Lake	158		13½	13½		
Chute of Island 30 (upper)	158	16	14½	11½		15-14
Chute of Island 30 (middle)	158½		13½			
Chute of Island 30 (lower)	159		12			
New Haven	163					
Plum Point	165			9½		
Foot of Bullerton	168	18	13½			12
Fulton gauge	175	12.0 to 13.4	9.6 to 8.4	6.5 to 6.2	7.5 to 8.2	9.1 to 10.5
Hatchie River	178	10				
Island No. 34	180		13½	12		
Morgans Point	181			13		
Island No. 35	194		11	9		12½
Pecan Point	196					
Walts	201	17	14	9		15
Corona	204					
Old River	208		18½	15		
Island No. 40	220					
Loosa Hatchee or Arthur	223					
Memphis gauge	230	12.1 to 14.2	11.1 to 9.4	7.2 to 6.8	7.8 to 8.9	8.9 to 10.5
Nonconnah	235					
Wyanoke	238					
Foot of Presidents Island	239					
Armstrong or Pattons	240				14	

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Sept. 11 to Sept. 12.	Sept. 19 to Sept. 21.	Sept. 26 to Sept. 27.	Oct. 2 to Oct. 4.	Oct. 5 to Oct. 7.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Head of Josie Harry Chute	243					
Horn Lake	244				11	
Daisy	252				9	
Star	259					
Head of McCulloughs towhead	269					
Peters	271				14	
Foxburns	275				14	
Mhoon Landing gauge	276	8.3 to 12.2	10.2 to 7.8	4.1 to 3.3	4.4 to 6.0	6.1 to 7.8
Hardins Point	287				17	
Helena gauge	306	10.2 to 14.2	14.1 to 11.6	8.4 to 7.6	8.2 to 9.2	9.5 to 10.7
Montezuma	313					
Friars Point	319				11	
Ledbetters	327				12½	
Head of Island No. 63	330				12½	
Sunflower Landing gauge	353	10.2 to 13.7	15.2 to 12.9	9.8 to 9.0	9.2 to 10.0	10.4 to 11.5
Andersons	359				14	
Towhead of Island No. 68	363					
Parkers	367				15	
Mouth of White River gauge	393	13.0 to 16.5	20.9 to 18.2	14.0 to 13.0	12.9 to 13.6	14.0 to 15.2
Indian Point	406				13½	
Jersey Point	420					
Catfish Point	422				(1)	
Arkansas City gauge	438	9.2 to 12.2	18.7 to 16.1	11.4 to 10.4	9.4 to 10.1	10.4 to 11.7
Moss Lake	455					
Selona	476					
Greenville gauge	478					
Refuge	484					
Longwood, Miss	501					
Grand Lake towhead	512					
Head of Louisiana Bend	517					
Ashton	519					
Wilsons Point	532					
Lake Providence gauge	542					
Salem	564					
Hendersons	573					
Youngs Point	597					
Vicksburg gauge	599					

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[1] 7½ feet was found, surveyor reports 9 feet.

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Oct. 24 to Oct. 26.	Oct. 27 to Oct. 29.	Oct. 31 to Nov. 2.	Nov. 5 to Nov. 8.	Nov. 9 to Nov. 12.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo gauge	0	12.2 to 9.8	9.2 to 7.5	7.0 to 6.4	6.0 to 5.6	5.6 to 5.2
Medleys	31			(1)	10½	
Lesters	55				12	
Slough	60				12	
Head of Island No. 10	63			13		
Kentucky Point	67			11		
Morrissons	69				12	
New Madrid gauge	70	11.1 to 8.9	8.4 to 7.0	6.4 to 5.8	5.4 to 5.0	5.0 to 4.6
Toneys	76			9½	13	
Nolans	76				13	
Upper Point Pleasant	80			12	10	
Darnells	82					
Linda	83			11		
Cherokee	89			12	10	
Joe Eckles	92			12		
Bass	93			13		
Island No. 14 or Reelfoot	99					
Fritz	101	12		9	(2)	
Hathaway	104			17		
Foot of Island No. 16	120			15		
Cottonwood Point gauge	123	8.6 to 6.1	5.5 to 3.7	2.9 to 2.1	1.6 to 1.2	1.0 to 0.6
Foot of Island No. 21	131			11	13	
Wrights Point	134					
Hales Point	136			13	13	
River Styx	139			10½	11	
Forked Deer	146			11	10	
O'Donnells	149	13		9½	9	
Fletchers towhead	157			10½		
Gold Dust or Round Lake	158	(3)		(4)	(5)	
Chute of Island 30 (upper)	158			9		
Chute of Island 30 (middle)	158½					
Chute of Island 30 (lower)	159					
New Haven	163			(6)	(7)	
Plum Point	165					
Foot of Bullerton	168	12		(8)	(9)	
Fulton gauge	175	9.5 to 7.4	7.0 to 5.6	4.9 to 4.4	4.9 to 3.6	3.6 to 3.2
Hatchie River	178	14				
Island No. 34	180			10	11	
Morgans Point	181			17		
Island No. 35	194	13		10	(10)	
Pecan Point	196			16	12	
Walts	201	13		[11] 9	(10)	
Corona	204			9	11	
Old River	208	18		9	10	
Island No. 40	220					
Loosa Hatchee or Arthur	223	12		10	9	
Memphis gauge	230	10.8 to 8.6	8.1 to 6.5	5.6 to 5.0	4.6 to 4.0	4.0 to 3.6

[1] Dredge in channel; survey shows 9 feet.
[2] 8 feet was found at night.
[3] 6 feet was found, but was not controlling depth.
[4] 8 feet was found, but was not controlling depth.
[5] 7 feet, 1 cast, channel in chute of Island No. 30.
[6] 7 feet was found, but was not controlling depth.
[7] 8 feet was found, dredge at work; another channel in chute of Island 30.
[8] 8 feet was found, but survey shows 9½ feet .
[9] 8 feet was found, dredge at work.
[10] 6 feet was found at night.
[11] Dredge in channel.

Table 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Oct. 24 to Oct. 26.	Oct. 27 to Oct. 29.	Oct. 31 to Nov. 2.	Nov. 5 to Nov. 8.	Nov. 9 to Nov. 13.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Nonconnah	235					
Wyanoke	238		(1)			9
Foot of Presidents Island	239					
Armstrong or Pattons	240					
Head of Josie Harry Chute	243					[2]9
Horn Lake	244		9			
Daisy	252		8½			[2]9
Star	259					10
Head of McCulloughs towhead	269					
Peters	271		15			10
Foxburns	275					11
Mhoon Landing gauge	276	10.2 to 7.3	6.4 to 3.7	2.3 to 0.8	−0.1 to −0.7	−0.9 to −1.5
Hardins Point	287		17			9
Helena gauge	306	14.6 to 11.8	11.0 to 8.7	7.4 to 6.2	5.4 to 5.0	4.8 to 4.2
Montezuma	313					10½
Friars Point	319					11
Ledbetters	327		13			
Head of Island No. 63	330		16			[3]9
Sunflower Landing gauge	353	15.8 to 13.4	12.7 to 10.2	8.9 to 7.8	6.9 to 6.3	6.2 to 5.6
Andersons	359		16			12
Towhead of Island No. 68	363					
Parkers	367		17			12½
Mouth of White River gauge	393	22.6 to 20.1	19.4 to 16.6	14.8 to 12.8	11.2 to 10.1	10.0 to 9.0
Indian Point	406					11
Jersey Point	420					
Catfish Point	422					(4)
Arkansas City gauge	438	20.7 to 18.2	17.5 to 14.5	12.6 to 10.6	8.4 to 7.0	6.9 to 5.9
Moss Lake	455					(5)
Salona	476					10
Greenville gauge	478				5.6 to 4.4	4.2 to 3.4
Refuge	484					10½
Longwood, Miss	501					15
Grand Lake towhead	512					
Head of Louisiana Bend	517					
Ashton	519					[3]11
Wilsons Point	532					
Lake Providence gauge	542				5.4 to 3.6	3.4 to 2.8
Salem	564					
Hendersons	573					
Youngs Point	597					
Vicksburg gauge	599				6.8 to 4.9	4.6 to 3.4

8 feet was found, but was not controlling depth.

[2] Dredged channel.

[3] From survey.

[4] Survey of Nov. 9 shows 9 feet.

[5] 7 feet was found, but was not controlling depth.

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Nov. 14 to Nov. 16.	Nov. 21 to Nov. 23.	Nov. 24 to Nov. 29.	Nov. 30 to Dec. 2.	Dec. 8 to Dec. 10.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Cairo gauge	0	5.2 to 5.3	5.5 to 5.3	5.2 to 6.3	6.2 to 7.8	10.1 to 11.4
Medleys	31	....	....	....	....	....
Lesters	55	....	....	....	....	....
Slough	60	....	....	....	....	....
Head of Island No. 10	63	....	....	....	....	....
Kentucky Point	67	....	....	....	....	....
Morrissons	69	....	....	....	....	....
New Madrid gauge	70	4.6 to 4.6	4.8 to 4.6	4.6 to 5.2	5.2 to 5.8	8.6 to 8.5
Toneys	76	....	....	....	....	....
Nolans	76	....	....	....	....	....
Upper Point Pleasant	80	12	12	....	....	....
Darnells	82	....	....	....	....	....
Linda	83	....	....	....	....	....
Cherokee	89	12	12	....	....	....
Joe Eckles	92	....	....	....	....	....
Bass	93	....	....	....	....	....
Island No. 14 or Reelfoot	99	....	....	....	....	....
Frits	101	9½	11	....	10	14½
Hathaway	104	....	....	....	....	....
Foot of Island No. 16	120	....	....	....	....	....
Cottonwood Point gauge	123	0.6 to 0.4	0.6 to 0.4	0.4 to 0.8	1.0 to 1.1	4.6 to 4.4
Foot of Island No. 21	131	12	13	....	....	....
Wrights Point	134	19	....	....	....	....
Hales Point	136	12½	12	....	....	....
River Styx	139	10½	10½	....	11	....
Forked Deer	146	12	12	....	....	....
O'Donnells	149	[1] 10	(2)	....	9½	....
Fletchers towhead	157	9½	10	....	....	11
Gold Dust or Round Lake	158	(3)	10	....	(4)	11
Chute of Island 30 (upper)	158	....	....	....	....	....
Chute of Island 30 (middle)	158½	....	....	....	....	....
Chute of Island 30 (lower)	159	....	....	....	....	....
New Haven	163	(3)	9	....	8	12
Plum Point	165	....	....	....	....	....
Foot of Bullerton	168	[1] 9½	(5)	....	11	12
Fulton gauge	175	3.2 to 3.0	3.1 to 3.1	3.0 to 3.1	3.2 to 3.4	6.1 to 5.8
Hatchie River	178	....	....	....	....	....
Island No. 34	180	10	9	....	9½	12
Morgans Point	181	....	....	....	....	....
Island No. 35	194	9	9	....	10	14
Pecan Point	196	12	17	....	....	....
Walts	201	(6)	8	....	9	....
Corona	204	10	11	....	9	....
Old River	208	11	12	....	....	....
Island No. 40	220	....	....	....	....	....
Loosa Hatchee or Arthur	223	(6)	11	....	12	....
Memphis gauge	230	3.6 to 3.3	3.4 to 3.4	3.4 to 3.2	3.4 to 3.6	6.4 to 6.2
Nonconnah	235	....	....	....	....	....
Wyanoke	238	....	....	9	....	....

[1] From survey.
[2] 8½ feet found; there was 9 feet in the crossing.
[3] 7 feet was found; another channel in chute of Island No. 30.
[4] 8 feet was found, at night.
[5] 7 feet was found on inspection trip but was too low.
[6] 8 feet was found; probably 9 feet in channel.

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.				
		Nov. 14 to Nov. 16.	Nov. 21 to Nov. 23.	Nov. 24 to Nov. 29.	Nov. 30 to Dec. 2.	Dec. 8 to Dec. 10.
		Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*
Foot of Presidents Island	239			(1)		
Armstrong or Pattons	240					
Head of Josie Harry Chute	243			9		
Horn Lake	244					
Daisy	252			[2] 9		
Star	259			9		
Head of McCulloghs towhead	269					
Peters	271			11		
Foxburns	275			10		
Mhoon Landing gauge	276	−1.5 to −1.8	−1.8 to −1.8	−1.8 to −1.8	−1.7 to −1.1	2.9 to 3.1
Hardins Point	287			11		
Helena gauge	306	4.2 to 3.8	3.7 to 3.7	3.6 to 3.2	3.2 to 3.6	6.4 to 7.0
Montezuma	313			9		
Friars Point	319			9½		
Ledbetters	327					
Head of Island No. 63	330			10		
Sunflower Landing gauge	353	5.6 to 5.4	5.1 to 5.1	5.1 to 4.8	4.8 to 5.1	7.4 to 8.0
Andersons	359					
Towhead of Island No. 68	363			10		
Parkers	367			11		
Mouth of White River gauge	393	9.0 to 8.7	8.3 to 8.2	8.2 to 7.8	7.8 to 8.0	10.3 to 11.6
Indian Point	406			11		
Jersey Point	420					
Catfish Point	422			10		
Arkansas City gauge	438	5.7 to 5.4	4.8 to 4.8	4.8 to 4.4	4.3 to 4.3	6.3 to 7.9
Moss Lake	455			10		
Salona	476			11		
Greenville gauge	478	3.2 to 2.8	2.4 to 2.3	2.3 to 2.0	1.9 to 1.9	3.3 to 3.0
Refuge	484			19		
Longwood, Miss	501			14		
Grand Lake towhead	512			10½		
Head of Louisiana Bend	517			11½		
Ashton	519					
Wilsons Point	532			8½		
Lake Providence gauge	542	2.3 to 2.0	1.3 to 1.2	1.2 to 0.9	0.8 to 0.7	
Salem	564			9		
Hendersons	573			10		
Youngs Point	597			10½		
Vicksburg gauge	599	3.3 to 2.9	2.2 to 2.0	1.9 to 1.8	1.7 to 1.4	

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[1] 10 feet in channel to right of Presidents Island.

[2] Channel very narrow and crooked.

TABLE 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.			
		Dec. 13 to Dec. 16.	Dec. 18 to Dec. 20.	Dec. 22 to Dec. 23.	Dec. 27 to Dec. 29.
		Feet.	*Feet.*	*Feet.*	*Feet.*
Cairo gauge	0	14.4 to 12.3	10.6 to 8.5	7.7 to 7.1	6.1 to 6.7
Medleys	31				
Lesters	55				
Slough	60				
Head of Island No. 10	63				
Kentucky Point	67				
Morrissons	69				
New Madrid gauge	70	11.4 to 10.7	9.4 to 7.6	6.8 to 6.3	5.2 to 5.4
Toneys	76				
Nolans	76				
Upper Point Pleasant	80				
Darnells	82				
Linda	83				
Cherokee	89				
Joe Eckles	92			12	10
Bass	93				
Island No. 14 or Reelfoot	99				
Frits	101		12	12	9
Hathaway	104				
Foot of Island No. 16	120				
Cottonwood Point gauge	123	6.7 to 7.4	6.2 to 4.2	3.1 to 2.6	1.4 to 1.4
Foot of Island No. 21	131				
Wrights Point	134				
Hales Point	136				
River Styx	139				11
Forked Deer	146				
O'Donnells	149				
Fletchers towhead	157				
Gold Dust or Round Lake	158		10½	10	9
Chute of Island 30 (upper)	158				
Chute of Island 30 (middle)	158½				
Chute of Island 30 (lower)	159				
New Haven	163		14	12	10
Plum Point	165				
Foot of Bullerton	168		14	12	11
Fulton gauge	175	7.0 to 8.2	7.4 to 5.7	5.0 to 4.6	3.6 to 3.4
Hatchie River	178				
Island No. 34	180			11	9½
Morgans Point	181				
Island No. 35	194		11	11	11
Pecan Point	196				
Walts	201		13	11	9
Corona	204				
Old River	208				
Island No. 40	220				
Loosa Hatchee or Arthur	223				
Memphis gauge	230	7.0 to 8.8	8.2 to 6.6	5.6 to 5.1	3.9 to 3.7
Nonconnah	235				
Wyanoke	238				
Foot of Presidents Island	239				
Armstrong or Pattons	240				

Table 4.—*Depths over shoal crossings, Mississippi River below Cairo, low-water season of 1910*—Continued.

Name of crossing.	Miles below Cairo.	Dates of trips.			
		Dec. 13 to Dec. 16.	Dec. 18 to Dec. 20.	Dec. 22 to Dec. 23.	Dec. 27 to Dec. 29.
		Feet.	*Feet.*	*Feet.*	*Feet.*
Head of Josie Harry Chute	243	14			
Horn Lake	244				
Daisy	252	(1)			
Star	259	15			
Head of McCulloughs towhead	269				
Peters	271	17			
Foxburns	275				
Mhoon Landing gauge	276	3.6 to 6.7	6.3 to 4.5	2.9 to 1.1	−0.2 to −0.7
Hardins Point	287				
Helena gauge	306	7.0 to 9.6	9.7 to 8.2	7.0 to 6.1	4.5 to 4.1
Montezuma	313				
Friars Point	319				
Ledbetters	327				
Head of Island No. 63	330	15			
Sunflower Landing gauge	353	8.1 to 10.2	10.6 to 9.8	8.5 to 7.8	6.0 to 5.6
Andersons	359				
Towhead of Island No. 68	363				
Parkers	367				
Mouth of White River gauge	393	11.4 to 13.5	14.4 to 13.8	12.6 to 11.6	9.5 to 9.0
Indian Point	406				
Jersey Point	420				
Catfish Point	422				
Arkansas City gauge	438	8.2 to 9.7	11.0 to 10.9	9.9 to 8.9	6.6 to 5.8
Moss Lake	455	13			
Salona	476				
Greenville gauge	478	5.3 to 6.4			
Refuge	484				
Longwood, Miss	501				
Grand Lake towhead	512				
Head of Louisiana Bend	517				
Ashton	519				
Wilsons Point	532				
Lake Providence gauge	542				
Salem	564				
Hendersons	573				
Youngs Point	597				
Vicksburg gauge	599				

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[1] 13 feet, 250 feet wide on Dec. 20, from survey.

TABLE 5.—*Dimensions of channel through bars, Mississippi River below Cairo, dredging season of 1910, determined from surveys.*

Miles below Cairo.	Name of crossing.	Date of survey, 1910.	Least depth in channel 250 feet wide.	Least width of 9-foot channel.	Gauge and its reading at time of survey.	
					Reading.	Gauge.
			Feet.	*Feet.*	*Feet.*	
31	Medleys	Aug. 22	11.0	750	8.9	Columbus.
		Sept. 15	21.0	3,650	17.2	
		Oct. 29	7.5	0	8.2	
		Nov. 6	10.0	300	6.4	
		Nov. 8	10.5	300	6.2	
		Nov. 25	10.0	350	5.5	
		Dec. 21	13.0	750	8.3	
80	Point Pleasant (upper)	July 18–20	20.0	(1)	22.0–24.7	New Madrid.
		Aug. 1–2	15.0	2,000	16.4–16.6	
		Aug. 6–7	14.0	1,000	14.8–14.2	
		Aug. 14	11.0	700	10.3	
		Aug. 26–27	9.0	200	8.7– 9.8	
		Sept. 5–6	11.5	550	7.2– 7.3	
		Sept. 16–17	18.0	1,800	14.5–13.2	
		Oct. 19–20	17.0	1,500	15.5–14.6	
		Oct. 26	14.5	700	9.1	
		Nov. 22–23	11.0	450	4.7– 4.6	
		Dec. 12–15	16.0	900	10.4–11.4	
81	Point Pleasant (middle)	Sept. 22	12.5	900	9.8	Do.
		Oct. 30	10.5	500	6.7	
82	Point Pleasant (lower)	Sept. 28	15.0	1,200	9.4	Do.
		Nov. 3	10.0	350	5.7	
		Nov. 12	10.5	550	4.7	
80–82	Point Pleasant country	Dec. 22	13.0	1,800	6.7	Do.
92	Joe Eckles	Nov. 30–Dec. 3	12.0	900	5.2– 6.8	Do.
		Dec. 23	10.5	850	6.3	
99	Island No. 14	Aug. 9	11.0	800	12.9	Do.
101	Fritz	Aug. 11	11.0	400	11.4	Do.
		Aug. 17	10.0	350	9.1	
		Aug. 24	7.0	50	7.7	
		Aug. 29	12.0	1,100	10.0	
		Sept. 2	10.0	600	8.1	
		Sept. 8	14.0	1,300	11.1	
		Sept. 19	17.0	1,650	11.7	
		Oct. 22	18.5	1,450	13.0	
		Nov. 1	10.0	650	6.1	
		Nov. 11	8.5	230	4.8	
		Dec. 26	11.0	1,050	5.4	
150	O'Donnells	Nov. 8	10.0	700	3.6	Fulton.
		Nov. 26	10.0	750	2.9	
158	Gold Dust	July 28–29	14.5	2,700	16.2–14.6	Do.
		Aug. 15	8.5	0	8.1	
		Oct. 10	18.2	(1)	16.4	
		Oct. 24	10.0	1,200	9.3	
		Nov. 5	8.5	225	4.0	
		Nov. 21	9.5	325	3.1	
		Dec. 7	12.0	425	6.0	
		Dec. 20	12.5	700	5.8	
159	Chute of Island No. 30	Aug. 9	10.5	1,000	10.8	Do.
		Aug. 12	9.5	500	9.1	
		Aug. 17	8.5	150	7.4	
		Aug. 24–25	8.0	150	5.7– 6.0	
		Aug. 29–30	10.0	350	7.4– 7.7	
		Sept. 6–7	10.0	300	5.5– 5.4	
		Sept. 24	7.5	150	7.0	
		Sept. 30	12.5	350	7.0	
		Oct. 22	16.0	900	10.8	
163	New Haven	Oct. 18–20	14.0	1,200	14.1–11.1	Do.
		Nov. 3	5.0	....	4.2	
		Nov. 10	8.0	125	3.4	
		Nov. 19	7.5	200	3.0	
		Dec. 6	10.5	300	5.6	
		Dec. 20	12.0	400	5.8	
167	Foot of Bullerton	Aug. 13	13.0	1,450	8.7	Do.
		Aug. 25	10.4	550	5.9	
		Sept. 1	10.0	1,450	7.0	
		Sept. 26	10.6	550	6.4	
		Nov. 1	9.0	500	4.6	
		Nov. 10	9.0	250	3.4	
		Nov. 18	10.0	400	3.0	
		Nov. 25	9.5	600	2.9	
		Dec. 19	14.5	850	6.5	
180	Island No. 34	Nov. 18	10.0	350	3.0	Do.

[1] Unlimited.

TABLE 5.—*Dimensions of channel through bars, Mississippi River below Cairo, dredging season of 1910, determined from surveys*—Continued.

Miles below Cairo.	Name of crossing.	Date of survey, 1910.	Least depth in channel 250 feet wide.	Least width of 9-foot channel.	Gauge and its reading at time of survey.	
					Reading.	Gauge.
			Feet.	*Feet.*	*Feet.*	
194	Island No. 35	Aug. 10	9.0	400	11.7	Memphis.
		Aug. 17	10.3	200	8.6	
		Aug. 24	10.0	400	6.6	
		Oct. 28	10.0	850	7.2	
		Nov. 11	9.0	250	3.7	
		Nov. 23	9.5	400	3.4	
		Dec. 1	10.5	725	3.6	
		Dec. 29	10.5	600	3.7	
196	Pecan Point	Aug. 23	14.0	1,000	6.8	Do.
		Oct. 7	16.0	[1]	10.4	
201	Walts	Aug. 19	11.5	1,000	7.8	Do.
		Oct. 7	15.3	1,200	10.4	
		Oct. 29–30	10.0	750	6.6–5.9	
		Nov. 16	8.0	....	3.3	
		Nov. 23	8.5	150	3.4	
		Dec. 3	10.7	450	3.6	
		Dec. 29	11.5	750	3.7	
237	Nonconnah	Nov. 29	10.0	300	3.2	Do.
238	Berkleys	Sept. 7	14.0	450	6.2	Do.
240	Foot of Presidents Island	Aug. 20	7.0	100	7.6	Do.
		Sept. 2	10.0	500	7.7	
		Nov. 8	11.0	350	4.1	
243	Head of Josie Harry Chute	Nov. 6	7.5	....	4.4	Do.
		Nov. 17	6.0	200	3.2	
		Nov. 26	9.5	300	3.2	
245	Josie Harry towhead	Dec. 31	11.0	500	4.2	Do.
244	Horn Lake	Nov. 7-10	8.5	200	4.2–3.8	Do.
		Dec. 3	9.5	250	3.6	
247	Foot of Josie Harry Chute	Nov. 10–11	12.0	400	3.8–3.7	Do.
252	Daisy	Aug. 30	13.5	2,650	8.4	Do.
		Nov. 3	8.0	....	4.8	
		Nov. 16	5.5	100	3.3	
		Nov. 25	6.5	75	3.3	
		Dec. 2	8.0	225	3.6	
		Dec. 7	10.0	400	6.2	
		Dec. 20	13.0	600	6.8	
		Dec. 31	7.0	150	4.2	
329	Head of Island No. 63	Nov. 2	10.0	850	7.8	Sunflower.
422	Catfish towhead	Sept. 2–3	11.0	650	12.1-11.7	Arkansas City.
		Sept. 10	4.5	....	8.6	
		Sept. 25	11.0	1,050	12.1	
		Oct. 1	9.0	300	9.2	
		Oct. 29	14.0	1,400	14.8	
		Nov. 5	10.0	550	8.3	
		Nov. 9	8.0	100	6.8	
		Nov. 22	10.0	725	4.8	
		Dec. 18	16.5	1,500	11.0	
455	Moss Lake	Nov. 19	9.0	450	2.5	Greenville.
		Dec. 17	13.0	650	7.0	
519	Ashton	Sept. 7	8.2	....	6.7	Do.
		Nov. 8	9.0	250	4.4	
		Nov. 17	12.5	750	2.8	
		Dec. 11	17.0	1,700	5.2	
532	Wilsons	Nov. 26	9.0	500	1.2	Lake Providence.
557	Arcadia	Nov. 28	9.0	1,100	1.0	Do.
573	Henderson	Nov. 11	11.0	500	2.8	Do.
		Nov. 29	9.5	425	.9	
597	Youngs Point	Nov. 14	9.0	500	3.3	Vicksburg.
		Nov. 21	12.0	900	2.2	
		Dec. 8	12.0	350	2.2	
614	Diamond Island	Oct. 8	19.0	1,600	8.2	Do.
620	New Town	Dec. 6	12.0	1,200	1.8	Do.

[1] Unlimited.

TABLE 6.—*Summary of dredging operations, Mississippi River below Cairo, during the low-water season of 1910.*

GAMMA.

Points of operation.	Distribution of time.									Distance towed.	Number of cuts.	Total length of cuts.	Average rate of advance per hour.	Average depth suction lowered.	Average depth of cut.	Average steam pressure per square inch.	Average speed main pump, revolutions per minute.
	Placing plant.	Dredging.	Changing cuts.	Repairing.	Passing boats.	Making up tow.	Towing.	Not working, awaiting lower stage, etc.	Total.								
	Hours.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Miles.*		*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Pounds.*	
Fritz or Island No. 14 (101), Aug. 12-30	12.35	146.55	11.05	105.05	5.00	....	78.55	[1] 80.55	440.30	131	15	12,350	84	15	5.3	121	135
Going to dredge fleet, West Memphis, Ark. (232), Aug. 30-31	....	....	....	....	....	2.20	30.05	7.05	39.30	131	....	....	....	....	....	....	....
West Memphis, Ark. (232), Sept. 15-Oct. 29	3.10	[2] 51.54	.58	[3] 253.45	....	....	....	757.13	1,067.00	....	9	4,180	81	10.5-16.5	5.6	130	145
Walts (201), Oct. 29-Nov. 2	2.10	48.15	6.05	.15	....	1.20	21.25	[4] 12.00	91.30	31	16	11,135	231	16	4.3	141	150
Bullerton (167), Nov. 2-15	5.30	69.53	4.42	3.45	....	2.00	27.20	[5] 205.20	318.30	34	16	13,700	196	16	4.7	140	148
Island No. 35 (194), Nov. 15-22	6.30	27.01	3.34	3.10	....	....	5.20	117.25	163.00	26	10	7,725	286	12	3.7	139	148
Walts (201), second time, Nov. 22-Dec. 11	6.30	100.00	17.00	[6] 65.05	....	....	2.35	[7] 266.40	457.50	8	32	26,075	261	14.5-16	4.5	139	146
Going into winter quarters, Dec. 11-16	....	....	....	....	....	....	4.25	129.45	134.10	31	....	....	....	....	....	....	....
Total and average	36.25	443.58	43.24	431.05	5.00	5.40	170.05	1,576.23	2,712.00	392	98	75,165	169	10.5-16.5	4.6	135	145

[1] Includes 9 hours waiting for coal.

[2] Dredging at West Memphis was incident to testing new suction head.

[3] Includes 17.10 hours repairs to main pumping engine and 222.25 hours repairs to port winding engine.

[4] Includes 5.30 hours waiting for placing of buoy.

[5] Includes 30.40 hours cleaning boilers.

[6] Repairs to tender.

[7] Includes 11 hours cleaning boilers.

EPSILON.

Patton (241), Aug. 20–Sept. 1	43.30	24.50	4.40	[1] 6.30	....	2.00	3.00	215.30	300.00	8	6	4,500	180	12–15	3.2	111	159
Catfish Point (422), Sept. 1–13	13.00	26.20	10.40	24.30	....	4.45	52.25	168.20	300.00	176	8	6,725	255	12–17	4.4	124	160
Greenville (478), lying up, Sept. 14–30	....	....	....	....	....	9.30	8.00	372.30	390.00	56	....	....	....	....	....	....	....
Catfish Point (422), second time, Sept. 30–Oct. 11	17.00	73.55	48.30	6.10	....	4.25	33.00	[2] 83.00	266.00	56	27	22,000	243	11–17	5.2	122	160
Rosedale (398), lying up, Oct. 11–Nov. 1	....	....	....	....	....	....	27.00	475.20	502.20	24	....	....	....	....	....	....	....
Catfish Point (422), third time, Nov. 1–7	16.35	80.25	19.15	14.10	....	....	4.30	6.00	140.55	24	12	20,650	257	16	4.2	130	160
Ashton (519), Nov. 7–17	8.15	54.00	19.15	.30	....	12.45	45.15	103.30	243.30	97	13	17,150	318	14–16	2.9	130	160
Youngs Point (597), Nov. 17–21	6.30	35.00	8.50	6.30	....	2.10	10.45	26.20	96.05	79	8	8,450	241	16	5.5	130	160
Vicksburg (600), lying up, Nov. 21–Dec. 8	....	....	....	....	....	....	1.30	413.40	415.10	2	....	....	....	....	....	....	....
Going into winter quarters, Dec. 8–27	....	....	....	58.00	....	4.00	296.30	107.30	466.00	368	....	....	....	....	....	....	....
Total and average	104.50	294.30	111.10	116.20	....	39.35	481.55	1,971.40	3,120.00	890	74	79,475	270	11–17	4.3	125	160

ZETA.

West Memphis (232), Sept. 2–14	....	....	....	....	....	....	....	312.00	312.00	....	....	....	....	....	....	....	....
Josie Harry Chute (243), Nov. 5–14	26.30	91.35	21.35	[3] 35.15	....	8.45	2.15	45.25	231.20	10	21	14,690	160	11–13.5	3.5	126	155
Catfish Point (422), Nov. 14–21	24.05	39.50	8.55	28.05	....	18.50	54.35	2.20	176.40	180	16	9,500	239	14–15	3.40	130	158
Moss Lake (455), Nov. 22–26	6.45	45.00	18.30	....	....	10.10	4.20	17.15	102.00	33	20	13,125	292	13	3.9	133	165
Greenville (478), lying up, Nov. 26–Dec. 8	....	....	....	....	....	6.00	5.35	277.10	288.45	23	....	....	....	....	....	....	....
Going into winter quarters, Dec. 8–18	....	....	....	....	....	....	185.05	[4] 72.10	257.15	246	....	....	....	....	....	....	....
Total and average	57.20	176.25	49.00	63.20	....	43.45	251.50	726.20	1,368.00	492	57	37,315	212	11–15	3.6	130	159

[1] Includes 1.10 hours adjusting ponton joints.
[2] Includes 15 hours cleaning boilers.
[3] Includes 7.45 hours repairs to broken cable strap.
[4] Includes 67.55 hours waiting for coal.

Table 6.—*Summary of dredging operations, Mississippi River below Cairo, during the low-water season of 1910*—Continued.

IOTA.

Points of operation.	Distribution of time.									Distance towed.	Number of cuts.	Total length of cuts.	Average rate of advance per hour.	Average depth suction lowered.	Average depth of cut.	Average steam pressure per square inch.	Average speed main pump, revolutions per minute.
	Placing plant.	Dredging.	Changing cuts.	Repairing.	Passing boats.	Making up tow.	Towing.	Not working, awaiting lower stage, etc.	Total.								
	Hours.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Miles.*		*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Pounds.*	
Island No. 35 (194), Aug. 11–24	16.20	88.35	15.05	9.35	....	2.30	46.10	[1] 146.15	324.30	38	10	11,000	124	16–17	5.0	142	146
Walts (201), Aug. 24–Sept. 30	5.45	45.00	2.10	9.25	....	....	4.05	833.05	899.30	7	5	5,725	127	16	4.4	142	152
Island No. 35 (194), second time, Oct. 1–Nov. 1	2.30	36.45	4.35	4.55	....	6.30	3.25	692.00	750.40	7	7	7,850	214	16–17	4.4	132	148
Daisy (252), Nov. 1–16	31.45	125.55	20.45	48.10	3.10	....	15.50	[2] 114.15	359.50	56	26	20,450	162	12–14	3.9	138	150
West Memphis (232), lying up, Nov. 16–28	....	....	....	....	....	....	10.05	285.25	295.30	20	....	....	....	....	....	....	....
Daisy (252), second time, Nov. 28–Dec. 30	6.45	90.20	5.25	[3] 7.00	1.50	6.00	3.45	638.55	770.00	20	17	11,275	125	12–16	4.6	125	148
Going into winter quarters, Dec. 30–31	....	....	....	....	....	2.00	9.50	20.10	32.00	20	....	....	....	....	....	....	....
Total and average	63.05	386.35	58.00	79.05	5.00	17.00	93.10	2,730.05	3,432.00	168	65	56,300	146	12–17	4.4	138	149

[1] Includes 28.40 hours cleaning boilers.
[2] Includes 47.15 hours cleaning boilers and making minor repairs.
[3] Includes 1.05 hours repairs to pontoons.

KAPPA.

Head Island No. 30 (158), Aug. 10–Sept. 22	11.00	319.30	24.40	56.15	9.20	1.20	51.50	[1] 572.35	1,046.30	84	34	37,450	117	15–16	4.9	137	127
Head Island No. 30 (158), second time, Sept. 22–Oct. 26	3.00	157.55	11.40	15.35	5.55	....	4.00	[2] 609.55	808.00	7	19	22,900	145	15–16	4.4	138	127
Gold Dust (158), Oct. 26–Nov. 3	2.10	155.30	9.20	1.50	....	....	4.30	[3] 22.50	196.10	7	16	20,200	130	12–15	5.6	138	127
New Haven (162), Nov. 3–10	13.40	109.00	4.35	....	1.00	4.25	3.00	[4] 32.40	168.20	5	6	7,725	71	11–15	4.8	140	127
Gold Dust (158), second time Nov. 10–Dec. 30	2.05	178.30	20.30	4.10	1.05	3.05	4.10	[5] 984.55	1,198.30	8	23	27,425	154	13–15	4.5	140	127
Going into winter quarters, Dec. 30–31	....	....	....	....	....	1.15	23.15	14.00	38.30	71	....	....	....	....	....	....	....
Total and average	31.55	920.25	70.45	77.50	17.20	10.05	90.45	2,236.55	3,456.00	182	98	115,700	126	11–16	4.8	139	127

HENRY FLAD.

Island No. 35 (194), Aug. 9–16	[6] 22.30	65.45	1.45	0.40	0.40	8.00	23.10	[7] 54.30	177.00	37	4	6,400	97	16	5.8	131	128
Chute of Island No. 30 (158), Aug. 16–24	5.00	80.05	3.05	....	29.55	....	23.45	[8] 47.30	189.20	34	5	5,825	73	15–16	6.6	131	131
Chute of Island No. 30 (159), lower Aug. 24–26	1.45	54.40	4.30	....	....	....	0.15	4.30	65.40	2	5	5,850	107	13	4.2	129	131
Fritz (101), Aug. 27–Nov. 2	2.40	88.05	5.00	....	....	3.30	56.15	1,462.30	1,618.00	66	11	15,575	177	15–16	4.8	130	129
Fritz (101), second time, Nov. 2–Dec. 30	2.15	65.25	5.25	6.50	....	[9] 3.30	[10] 41.30	1,263.40	1,388.35	75	8	13,200	202	16	4.7	132	128
Going into winter quarters, Dec. 30–Jan. 2, 1911	....	....	....	....	....	8.00	46.25	35.00	89.25	131	....	....	....	....	....	....	....
Total and average	34.10	354.00	19.45	7.30	30.35	23.00	191.20	2,867.40	3,528.00	345	33	46.850	132	13–16	5.1	131	129

[1] Includes 92.35 hours cleaning boilers and repairs to pontoons and 36.10 hours waiting for survey.

[2] Includes 24.05 hours cleaning boilers.

[3] Cleaning boilers.

[4] Includes 22.45 hours cleaning boilers.

[5] Includes 20.45 hours cleaning boilers and 23.30 hours waiting for coal.

[6] Includes 16.30 hours recovering pontoons broken loose.

[7] Includes 28.10 hours cleaning boilers.

[8] Includes 40.05 hours cleaning boilers and making minor repairs.

[9] Making up coal tow for dredge Harrod.

[10] Includes 39.45 hours towing barge of coal to dredge Harrod.

TABLE 6.—*Summary of dredging operations, Mississippi River below Cairo, during the low-water season of 1910*—Continued.

B. M. HARROD.

Points of operation.	Distribution of time.									Distance towed.	Number of cuts.	Total length of cuts.	Average rate of advance per hour.	Average depth suction lowered.	Average depth of cut.	Average steam pressure per square inch.	Average speed main pump, revolutions per minute.
	Placing plant.	Dredging.	Changing cuts.	Repairing.	Passing boats.	Making up tow.	Towing.	Not working, awaiting lower stage, etc.	Total.								
	Hours.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Hours.*	*Miles.*		*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Pounds.*	
Island No. 14 (99), Aug. 3–14	2.35	69.20	1.05			6.00	78.30	113.00	270.30	134	5	11,250	162	14–18	7.4	143	135
Point Pleasant, upper (80), Aug. 14–18	2.15	58.50	2.00	0.10		2.00	6.00	23.15	94.30	18	9	11,900	202	16–18	5.2	138	135
Point Pleasant, lower (81), Aug. 18–31	16.50	112.35	13.20	4.10	1.00	3.30	1.00	[1] 165.20	317.45	1	14	21,200	188	14–18	6.5	138	135
Point Pleasant, upper (80), second time, Aug. 31–Sept. 5	2.40	80.25	2.45				1.00	[2] 29.15	116.05	1.5	10	21,800	271	16–18	4.2	131	133
Point Pleasant, lower (81), second time, Sept. 5–25	2.45	23.45	0.30			1.00	4.00	[3] 454.10	486.10	3.5	8	6,200	261	16–18	4.2	133	135
Darnells (82), Sept. 25–Oct. 7	4.15	26.20	0.40		.20	2.00	3.30	[4] 244.55	282.00	6	6	7,250	275	17–18	5.6	132	133
Caruthersville (110), lying up, Oct. 7–25						4.00	3.00	427.45	434.45	26							
Point Pleasant, lower (81), third time, Oct. 25–30	5.50	64.30	2.05	.15	.35		24.45	[5] 18.45	116.45	30	9	19,400	301	17–18	4.5	143	135
Medleys (31), Oct. 30–Nov. 8	6.45	103.25	12.10			5.30	30.00	[6] 57.20	215.10	53	13	22,950	222	16–18	5.4	143	135
Darnells (82), lying up, Nov. 8–23						4.35	21.45	341.00	367.20	53							
Tiptonville Bar (86), lying up, Nov. 23–Dec. 30							1.00	883.30	884.30	4							
Going into winter quarters, Dec. 30–Jan. 2, 1911						6.00	66.30	14.00	86.30	147							
Total and average	43.55	539.10	34.35	4.35	1.55	34.35	241.00	2,772.15	3,672.00	477	69	121,950	226	14–18	5.4	138	134

[1] Includes 24.05 hours cleaning boilers and 3 hours sounding crossing and placing buoys.

[2] Includes 17.15 hours waiting for coal.

[3] Includes 22.10 hours waiting for survey.

[4] Includes 18.55 hours waiting for steam, short of firemen.

[5] Delayed by high wind.

[6] Includes 4 hours wind bound and 22.15 hours cleaning boilers.

TABLE 7.—*Highest gauge readings, Mississippi River and tributaries, in 1911, to June 30.*

[See Table 1 for highest known readings.]

River.	Station.	Date.	Gauge readings.
		1911.	*Feet.*
Mississippi	St. Paul, Minn	May 24–25	[1] 3.2
Do	Rock Island, Ill	Feb. 19	9.6
Do	Hannibal, Mo	Feb. 22	12.8
Do	Grafton, Ill	Feb. 24	14.9
Do	St. Louis, Mo	Feb. 23	19.9
Do	Chester, Ill	Feb. 24	18.0
Do	Grand Tower, Ill	do	21.5
Do	Cape Girardeau, Mo	do	23.0
Do	Cairo, Ill. (Ohio River)	Apr. 20–21	45.4
Do	Columbus, Ky	Apr. 21	41.9
Do	New Madrid, Mo	Apr. 22	36.4
Do	Cottonwood Point, Mo	Apr. 23	34.8
Do	Fulton, Tenn	Apr. 25	32.9
Do	Memphis, Tenn	Apr. 25–26	36.4
Do	Mhoon Landing, Miss	Apr. 26–28	38.2
Do	Helena, Ark	Apr. 28–29	44.6
Do	Sunflower Landing, Miss	Apr. 29–30	42.6
Do	Mouth White River, Ark	May 1–2	48.3
Do	Arkansas City, Ark	May 2–3	48.0
Do	Greenville, Miss	May 3	41.7
Do	Lake Providence, La	May 4	41.6
Do	Vicksburg, Miss	May 6	45.1
Do	St. Joseph, La	May 7–8	41.1
Do	Natchez, Miss	May 7–12	44.3
Do	Red River Landing, La	May 12	42.6
Do	Bayou Sara, La	May 10–14	35.0
Do	Baton Rouge, La	May 13–16	32.4
Do	Plaquemine, La	May 13	28.4
Do	Donaldsonville, La	May 12–13	25.4
Do	College Point, La	May 15	21.5
Do	Carrollton, La	do	14.5
Do	Fort Jackson, La	Apr. 26	[2] 7.4
Arkansas	Little Rock, Ark	Apr. 15, 19–20	15.6
Atchafalaya	Barbre Landing, La	May 12–15	40.2
Do	Simmesport, La	May 13	37.1
Do	Melville, La	May 12–14	36.8
Cumberland	Nashville, Tenn	Apr. 10–11	38.6
Illinois	Peoria, Ill	Feb. 21–23	14.9
Missouri	Kansas City, Mo	Feb. 20	13.5
Do	Hermann, Mo	Feb. 21	14.1
Ohio	Cincinnati, Ohio	Feb. 3	49.1
Do	Louisville, Ky. (upper)	Feb. 5	22.9
Do	Louisville, Ky. (lower)	Feb. 5–6	48.2
Do	Evansville, Ind	Feb. 9	38.8
Do	Paducah, Ky	Apr. 20	42.6
Do	Cairo, Ill	Apr. 20–21	45.4
Ouachita	Camden, Ark	Apr. 22	38.2
Do	Monroe, La	May 9–14	36.9
Red	Fulton, Ark	Apr 21	25.0
Do	Shreveport, La	Apr. 25–27	13.4
Do	Alexandria, La	Apr. 29–30	25.4
St. Francis	Bridge, St. Louis, Iron Mountain & Southern Ry.	Apr. 26–29	21.8
Tennessee	Chattanooga, Tenn	Apr. 9	29.9
Do	Florence, Ala	Apr. 10	22.0
Do	Johnsonville, Tenn	Apr. 17	36.1
Wabash	Mount Carmel, Ill	Apr. 22	19.6
White	Jacksonport, Ark	Apr. 18	25.4
Do	Clarendon, Ark	Apr. 27	29.0
Yazoo	Yazoo City, Miss	May 12–18	25.1

[1] River frozen to Mar. 7.

[2] Caused by Gulf storm.

APPENDIX A.

LAWS AFFECTING THE MISSISSIPPI RIVER COMMISSION, JULY 1, 1910, TO JUNE 30, 1911.

[PUBLIC—No. 425.]

[H. R. 28632.]

AN ACT Making appropriations for the construction, repair, and preservation of certain public works on rivers and harbors, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums of money be, and are hereby, appropriated, to be paid out of any money in the Treasury not otherwise appropriated, to be immediately available, and to be expended under the direction of the Secretary of War and the supervision of the Chief of Engineers for the construction, completion, repair, and preservation of the public works hereinafter named:

* * * * * * *

Improving Mississippi River from Head of Passes to the mouth of the Ohio River, including salaries, clerical, office, traveling, and miscellaneous expenses of the Mississippi River Commission: Continuing improvement, with a view to securing a permanent channel depth of nine feet, three million dollars, which sum shall be expended under the direction of the Secretary of War in accordance with the plans, specifications, and recommendations of the Mississippi River Commission, as approved by the Chief of Engineers, for the general improvement of the river, for the building of levees between the Head of Passes and Cape Girardeau, Missouri, and for surveys, including the survey from the Head of Passes to the headwaters of the river, in such manner as in their opinion shall best improve navigation and promote the interests of commerce at all stages of the river: *Provided,* That of the money hereby appropriated so much as may be necessary shall be expended in the construction of suitable and necessary dredge boats and other devices and appliances and in the maintenance and operation of the same: *Provided further,* That the watercourses connected with said river and the harbors upon it, now under the control of the Mississippi River Commission and under improvement, may, in the discretion of said commission, upon approval by the Chief of Engineers, receive allotments for improvements now under way or hereafter to be undertaken, to be paid for from the amounts herein appropriated.

* * * * * * *

In the collection of statistics relating to traffic, the Corps of Engineers is directed to adopt a uniform system of classification for freight, and upon rivers or inland waterways to collate ton-mileage statistics as far as practicable.

* * * * * * *

Approved, February 27, 1911.

APPENDIX 2.

REPORT OF CAPT. CLARKE S. SMITH, CORPS OF ENGINEERS, ON OPERATIONS IN THE FIRST AND SECOND DISTRICTS.

UNITED STATES ENGINEER OFFICE,
Memphis, Tenn., May 31, 1911.

COLONEL: I have the honor to submit the following report of operations in the first and second districts, Mississippi River improvement, for the year ending May 31, 1911.

These districts were under the charge of Maj. M. L. Walker, Corps of Engineers, until September 20, 1910, on which date they were transferred to me.

The first district extends from Cape Girardeau, Mo., to the foot of Island 40, a distance of 270 miles. Operations in this district include bank protection work at Columbus and Hickman, Ky., and at New Madrid and Caruthersville, Mo.; systematic improvement of Plum Point Reach, Tennessee and Arkansas;

abattis dike work; levee work in the upper St. Francis and Reelfoot levee districts, and in the lower St. Francis levee district to milepost 139–140.

The second district extends from the foot of Island 40 to the mouth of White River (393 R.), a distance of 173 miles, excepting on the left bank, where it ends at the Coahoma-Bolivar County line (365 L.). Operations in this district include revetment work at Memphis, Tenn., Hopefield Bend and Helena, Ark.; the improvement of Wolf River, Tenn.; bank protection in Walnut Bend, Ark., and in Old Town Bend, Ark.; levee work in the White River and the upper Yazoo levee districts, and in the lower St. Francis levee district south of milepost 139–140.

PART I.—CHANNEL WORK.

This work has been under the immediate charge of Assistant Engineer M. Gardner, and this part of this report is compiled from data furnished in general by him.

FIRST DISTRICT (CAPE GIRARDEAU, MO., TO FOOT OF ISLAND 40, 270 MILES).

Columbus, Ky. (*21 L.*).—(For description and previous history see the current annual report of the Mississippi River Commission and Report Chief of Engineers, 1891, p. 3580. For last map see plate No. 1, Appendix 2, Report of the Chief of Engineers, 1905, Supplement.) Special appropriation.

Hickman, Ky. (*36 L.*).—(For references to previous history see the current annual report of the Mississippi River Commission and Report Chief of Engineers, 1905, Supplement, p. 152. For last map see plate No. 2, Report Chief of Engineers, 1905, Supplement, Appendix 2.) Special appropriation.

New Madrid, Mo. (*71 R.*).—(For references to previous history see the current annual report of the Mississippi River Commission and Report Chief of Engineers, 1905, Supplement, p. 152.) Special appropriation. See plate No. 3, herewith.

Caruthersville, Mo. (*110 R.*).—(For references to previous history see Report Chief of Engineers, 1909, pt. 3, p. 2730.) There is no immediate necessity for any work here, but in order to hold intact the existing revetment it is very likely that within a year or two extensions will have to be added above and below, in order to protect the existing work against erosion. See plate No. 4,[1] herewith.

Chute of Island 26 (*130 L.*).—(For references to previous history see Report Chief of Engineers, 1909, pt. 3, p. 2730.) There was very little change in this chute during the past year, and plate No. 5,[1] accompanying this report, shows its present condition.

Plum Point Reach (*147 to 168*).—(For reference to previous history see Report Chief of Engineers, 1909, pt. 3, p. 2730; for statement regarding existing works and their effect upon the river channels see the current annual report of the Mississippi River Commission.) Plate No. 5,[1] herewith, shows the present conditions.

The works of improvement in this reach extend from above Daniels Point to near Craighead Point, Ark., a distance of about 17 miles (151–168). These operations were begun in 1882 and have been fully described in subsequent reports. In general terms the work done has been the closure of Osceola and Bullerton Chutes by pile dikes; the partial closure of Gold Dust Chute by pile dikes and a brush and stone dam; the contraction of the low-water channel by dikes at Ashport Bar, Elmot Bar, and Plum Point; the revetment of caving banks above Daniels Point, throughout Ashport and Fletchers Bends, along a part of the fronts of Osceola and Bullerton Bars at Plum Point and near Craighead Point; and the construction of levees along both banks of the river.

Details of the work are as follows:

(a) *Daniels Point, Ark.* (*152 R.*).—(For description and previous history see Report Chief of Engineers, 1905, Supplement, p. 153, and report for 1909, part 3, p. 2731.) Caving continues slowly both above and in the unprotected pockets at the lower end of the revetment work, but there are no indications of any damage to the mattresses. See plate No. 5,[1] herewith.

(b) *Ashport Bend, Tenn.* (*155 L.*).—(For references to previous history see Report Chief of Engineers, 1905, Supplement, p. 153, and report for 1909, part 3, p. 2731.) The lower end of this revetment has suffered some damage, due to upstream travel of the erosion below the work. Some repairs should be made here to check further damage when the revetment plant can be spared from more urgent work. The upper half of this revetment is completely silted up by accretions to the main shore. See plate No. 5,[1] herewith.

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[1] Not printed.

(c) *Fletchers Bend, Ark.* (*158–161 R.*).—(For reference to previous history see Report Chief of Engineers, 1905, Supplement, p. 153, and subsequent reports.) From range 34 to range 36 some scour has taken place on the mats and to a greater extent in the channel, but no serious damage is apparent. The slight damage observed in March, 1909, just below Wolverton Landing should be repaired during the coming season. Plate No. 5,[1] accompanying this report, shows the present condition of this bend.

(d) *Osceola front, formerly Osceola bars* (*164 R.*).—(For reference to previous history see Reports Chief of Engineers, 1907, p. 2678; 1908, part 3, p. 2719; and 1900, part 3, p. 2734.) During the past year there has been no caving at the upper end of the revetment while at the lower end caving continues, but at a decreased rate. Unless something unexpected takes place above or below the existing revetment, no work will be necessary this season. Plate No. 5,[1] accompanying this report, shows the present condition of this front.

(e) *Bullerton Towhead* (*168 R.*).—(For description and previous history and references thereto see Report Chief of Engineers, 1905, Supplement, p. 153.) The revetment along this towhead has been covered with a sand bar for several years, but during the past year this bar has disappeared from about the upstream half, leaving the revetment exposed to the direct attack of the current. The revetment appears to be in good condition, however, and it is thought that no work will be required here during the coming season. See plate No. 5,[1] accompanying this report, for the condition, location, and extent of the work.

SECOND DISTRICT (FOOT OF ISLAND 40 TO WHITE RIVER, 173 MILES).

Hopefield Bend (*227–230 R.*).—(For description and previous history and references thereto see Reports Chief of Engineers, 1907, p. 2678; 1908, p. 2719; and 1909, p. 2737.) The work done here during the past season consisted of repairing four large breaks in the existing work. The mattress plant arrived at Hopefield Bend from Old Town, Ark., on December 29, 1910, and work was begun at once constructing the necessary pocket mats, grading, and paving the bank.

All the mats were completed and most of the bank graded and paved by March 4, when work was suspended on account of the high stage of the river. On March 23, grading and paving was resumed and finally completed April 8. After the completion of the season's work, the revetment in this bend was apparently in good condition. Plate No. 7, accompanying this report, shows its location and condition. The cost of the work is given in detail, as follows:

Connecting mats Nos. 1 to 9, inclusive (3,505 squares):	
Strand, ½-inch, 1,654 pounds	$46.80
Strand, $\frac{5}{16}$-inch, 6,311 pounds	160.30
Strand, ¼-inch, 19,027 pounds	523.24
Wire, No. 12, 8,896 pounds	195.71
Staples, 950 pounds	19.95
Clips, ½-inch, 156	3.92
Clips, $\frac{5}{16}$-inch, 1,894	136.37
Brush, 5,632 cords	9,287.82
Stone, 4,009 cubic yards	5,482.82
Steamboat expense	1,836.00
Labor, subsistence, and supervision	11,824.66
	29,517.59

Cost per square, $8.42.
Cords of brush and poles per square, 1.60.
Cubic yards of stone per square, 1.14.
Cubic yards of stone per cord of brush and poles, 0.712.

Grading (grading bank, 2,265 linear feet, equaling 33,200 cubic yards):	
Coal, etc	281.35
Labor, subsistence, and supervision	1,735.49
	2,016.84

Cost per linear foot, $0.89.
Cost per cubic yard, $0.0607.

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[1] Not printed.

Paving (paving bank, 2,265 linear feet, equaling 11,332 square yards):	
Stone, 3,342 cubic yards	$4,162.99
Labor, subsistence, and supervision	3,170.00
	7,332.99

Cost per linear foot, $3.23.
Cost per square yard, $0.647.
Cubic yards of stone per square yard of paving, 0.29.

Total field cost	38,867.42
Office expense	1,419.53
Surveys	1,392.07
Care of plant	475.18
Repairs to plant	2,267.93
Depreciation of plant	2,135.33
Total cost	46,557.46

All repair work, and hence the cost per linear foot of bank protected can not be given.

Value of material on hand, at the close of the season's work, to the credit of Hopefield Bend:	
Wire strand, etc	$4,472.76

Wolf River (*230 L.*).—(For references to previous history see Report Chief of Engineers, 1905, Supplement, p. 154, and report for 1908, pt. 3, p. 2723.) Special appropriation. An allotment of $10,000 was made from the appropriation of river and harbor act of 1910 to dredge this stream from its mouth to the county bridge, a distance of 2½ miles.

The dredge *Wolf* was put in commission on November 29, 1910, and began operations at the mouth of the river, and worked until January 9, 1911, when work had to be suspended on account of the high stage of the river. It was not possible to get the dredge in operation earlier in the season on account of the extensive repairs which the dredging plant required. The latter had been idle since the early part of 1908, there having been no allotment made for the improvement of the stream.

Operations were confined to dredging a channel through the bar at the mouth of the river and the shoaler places for a half mile above. The result of the season's work was the removal of 12,100 cubic yards of material and 5 logs. The following table shows the cost of the work in detail:

Labor and supervision	$1,131.65
Hire of tender	660.00
Coal	336.00
Oil and engine supplies	99.18
	2,226.83

Field cost per cubic yard, $0.184.

Field cost	2,226.83
Care of plant	11.87
Repairs to plant	56.69
Depreciation of plant	53.33
Total cost	2,348.77

COMMERCIAL STATISTICS OF WOLF RIVER.

Number of lumber manufacturing plants, 5.	
Capital invested	$1,698,213.57
Value of finished product, from May 1, 1910, to Apr. 30, 1910	$1,311,879.88
Amount paid in wages during same period	$393,947.50
Value in logs at mill	$499.348.76
Timber sawed feet B. M.	50,487,841
Towing plant employed:	
Steamboats (4), value	$45,000.00
Derrick boats (4), value	$15,000.00
Barges (16), value	$40,000.00
Sectional dry dock, value	$6,000.00

Memphis Harbor, Tenn. (*230–232 L.*).—(For references to description and previous history and present, see the current annual report of the Mississippi River Commission and Report Chief of Engineers, 1905, Supplement, p. 155.) See plate No. 7, herewith. The survey of last fall shows that the sand bar from the mouth of Wolf River to the foot of Court Street has receded from 50 to 150 feet and the slope of the cross section shows a scour of from 5 to 45 feet. This scour, however, has only removed previous fills and has not impaired the effectiveness of the revetment.

Walnut Bend, Ark. (*281 R.*).—(For reference to previous history and works see the current annual report of the Mississippi River Commission and Reports Chief of Engineers, 1908, part 3, p. 2724, and 1909, part 3, p. 2739.) For map showing general conditions and work done this year see plate No. 9, herewith. At the end of last season's work there was about 4,200 linear feet of revetment in place. The project for the season's work contemplated extending the upstream revetment to Whitehall Landing, a distance of about 2,400 feet, and from the lower end of the existing work downstream about 600 feet, and the repairs to a break in the existing work at range 15. The necessary plant reached Walnut Bend on August 19 and work was begun at once constructing mattresses. During the first part of the season no unusual difficulties were encountered. During the latter part of the season, however, rapid rises in the river gave considerable trouble on account of the flooding of the dead-men holes. The paving consists of the usual form of riprap, except 500 linear feet, which is concrete 4 inches thick, of 1 part Portland cement and 12 parts river sand and gravel, reenforced with wire mesh. The concrete was mixed with a Hains mixer, operated in connection with a derrick. This proved an economical although a rather slow method. All paving was carried up to the top bank. The revetment was finally completed on February 26 and the plant towed to Memphis. The season's work resulted in the extension of the revetment upstream to Whitehall Landing, a distance of 2,380 feet, and downstream 580 feet, and the repair of the break in the old work.

The following is a table of cost:

Channel mattress No. 7 (917 feet long by 254 feet wide, equaling 2,329 squares):	
Strand, ½-inch, 10,441 pounds	$271.47
Strand, 5/16-inch, 4,518 pounds	111.60
Strand, ¼-inch, 14,230 pounds	389.90
Wire, No. 12, 5,778 pounds	127.12
Wire, silicon bronze, 1,008 pounds	168.48
Staples, 500 pounds	10.50
Clips, ½-inch, 1,166	29.59
Clips, 5/16-inch, 1,622	116.78
Miscellaneous material	1,201.00
Brush and poles, 2,957 cords	4,879.05
Stone, 2,027 cubic yards	2,398.35
Steamboat expense	1,863.20
Labor, subsistence, and supervision	8,138.43
	19,705.47

Cost per linear foot, $21.49.
Cost per square, $8.47.
Cords of brush and poles per linear foot, 3.22.
Cords of brush and poles per square, 1.27.
Cubic yards of stone per linear foot, 2.21.
Cubic yards of stone per square, 0.87.
Cubic yards of stone per cord of brush and poles, 0.68.

Channel mattress No. 8 (1,480 feet long by 254 feet wide, equaling 3,759 squares):	
Strand, ½-inch, 17,192 pounds	453.08
Strand, 5/16-inch, 6,386 pounds	162.20
Strand, ¼-inch, 22,797 pounds	624.64
Wire, No. 12, 7,520 pounds	165.44
Wire, silicon bronze, 1,431 pounds	214.51
Staples, 700 pounds	14.70
Clips, ½-inch, 1,712	44.51
Clips, 5/16-inch, 2,064	148.61
Miscellaneous material	1,803.01

Channel mattress No. 8, etc.—Continued.

Brush and poles, 5,077 cords	$8,377.05
Stone, 2,999 cubic yards	3,548.42
Steamboat expense	3,129.82
Labor, subsistence, and supervision	12,170.74
	30,856.78

Cost per linear foot, $20.85.
Cost per square, $8.20.
Cords of brush and poles per linear foot, 3.43.
Cords of brush and poles per square, 1.35.
Cubic yards of stone per linear foot, 2.02.
Cubic yards of stone per square, 0.71.
Cubic yards of stone per cord of brush and poles, 0.59.

Channel mattresses Nos. 9 and 10 (596 feet long by 250 feet wide, equaling 1,514 squares):

Strand, ½-inch, 6,843 pounds	172.72
Strand, 5/16-inch, 3,184 pounds	78.64
Strand, ¼-inch, 9,057 pounds	248.16
Wire, No. 12, 4,573 pounds	100.61
Wire, silicon bronze, 650 pounds	97.43
Staples, 400 pounds	8.40
Clips, ½-inch, 559	14.53
Clips, 5/16-inch, 988	12.45
Brush and poles, 1,881 cords	3,103.65
Stone, 860 cubic yards	1,017.55
Steamboat expense	1,271.70
Labor, subsistence, and supervision	8,827.92
	14,953.76

Cost per linear foot, $25.09.
Cost per square, $9.21.
Cords of brush and poles per linear foot, 3.16.
Cords of brush and poles per square, 1.24.
Cubic yards of stone per linear foot, 1.44.
Cubic yards of stone per square, 0.57.
Cubic yards of stone per cord of brush and poles, 0.46.

Connecting mattresses Nos. 17, 18, 19, 20, 21, 22, 23, 24, 25, and 26 (2,542 squares):

Strand, ½-inch, 1,817 pounds	47.24
Strand, 5/16-inch, 7,287 pounds	179.99
Strand, ¼-inch, 14,560 pounds	398.94
Wire, No. 12, 7,862 pounds	172.96
Staples, 725 pounds	15.23
Clips, ½-inch, 223	5.80
Clips, 5/16-inch, 2,126	101.39
Brush and poles, 3,790 cords	6,253.50
Stone, 3,241.45 cubic yards	3,835.28
Steamboat expense	2,135.28
Labor, subsistence, and supervision	9,666.06
	22,811.67

New work, 2,291 squares.
Repair work, 251 squares.
Cost per square, $8.96.
Cords of brush and poles per square, 1.49.
Cubic yards of stone per square, 1.28.
Cubic yards of stone per cord of brush and poles, 0.81.

Grading bank (new work, 2,397 feet long by 100 feet wide, equaling 51,617 cubic yards; repair work, 300 feet long by 70 feet wide, equaling 6,268 cubic yards; total grading, 57,885 cubic yards):

Coal, 6,492 bushels	714.12
Labor, subsistence, and supervision	3,317.95
	4,032.07

Cost per linear foot, $1.50 (new work).
Cost per cubic yard, $0.0696.

Paving bank (new work, 1,897 feet by 101.8 feet, equaling 21,453 square yards; repair work, 3,772 square yards; total paving, 25,225 square yards):

Stone, 6,352 cubic yards	$11,545.76
Steamboat expense	1,500.00
Labor, subsistence, supervision, etc	7,516.66
	20,562.42

Cost per square yard, $0.8151.
Cost per linear foot, $9.22 (new work).
Cubic yards of stone per square yard, $0.25.

Paving bank (paving with concrete, 500 feet by 93.5 feet, equaling 5,196 square yards):

Gravel, 631 cubic yards	441.70
Cement, 1,702 sacks	765.90
Coal, 438 bushels	48.18
Wire, Pittsburgh fence, 49,500 square feet	245.03
Lumber	25.00
Labor, subsistence, and supervision	926.75
	2,452.56

Cost per square yard, $0.472.
Cost per linear foot, $4.905.
Cubic yards of gravel per square yard, 0.12.
Sacks of cement per square yard, 0.33.

Total field cost	115,374.68
Office expense	2,200.36
Surveys	478.60
Care of plant	3,088.73
Repairs to plant	14,741.57
Depreciation of plant	13,879.66
Total cost	149,763.60

Total unit cost:

Channel mattress, per linear foot	28.45
Connecting mattress, per linear foot	8.93
Grading, per linear foot	1.95
Paving, per linear foot	10.82
Total cost per linear foot of bank protected	50.15
Field cost per linear foot of bank protected	38.58

Value of material on hand at the close of the season's work to the credit of Walnut Bend:

Wire strand, etc	2,418.64

Helena, Ark. (*306 R.*).—(For references to previous history see current annual report of the Mississippi River Commission and Reports Chief of Engineers, 1905, Supplement, p. 155, and 1909, p. 2742.) Plate No. 10,[1] herewith, shows present conditions. With the exception of a small sink in the revetment about 500 feet below the elevator the work is in good condition. It is intended to repair this fault this season.

Old Town Bend, Ark. (*324 R.*).—(For references and previous history and works see the current annual report of the Mississippi River Commission and Report Chief of Engineers, 1908, part 3, p. 2728, and report for 1909, part 3, p. 2743.) Plate No. 11,[1] herewith, shows location of work and present condition of the revetment. At the end of last season's work there was 7,255 linear feet of revetment in place and this season's project contemplated the extension of the revetment downstream to the sunken timber, a distance of about 1,700 feet.

The plant with which this work was done left Memphis September 7, 1910, When only a short distance below the fleet the tow went aground, but was floated and arrived at Old Town on September 12. The first work undertaken was to pave the bank along some of the past season's work in order to free the barges for brush service and to enable the contractor to deliver a supply of brush. Mat construction was begun on September 30 and prosecuted as rapidly as possible. There were no unusual difficulties encountered during the progress of construction, although rapid rises in the river on two occasions interfered with its progress. The paving along the season's work was carried up to about the 20-foot stage on the Helena gauge, high enough to cover the sand strata and make it perfectly safe for the present at least. The mattress work was completed on December 24 and the mat plant towed to Hopefield Bend, Ark. A small party was left at Old Town to complete the paving, which was accomplished on January 14.

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[1] Not printed.

The season's work resulted in the extension of the revetment downstream 1,700 feet.

The following is a table of costs:

Channel mattress No. 9 (798 feet long by 250 feet wide, equaling 1,995 squares):

Strand, ½ inch, 13,432 pounds	$380.13
Strand, 5/16 inch, 4,072 pounds	103.43
Strand, ¼ inch, 11,243 pounds	309.18
Wire, No. 12, 4,770 pounds	104.94
Wire, silicon bronze, 860 pounds	128.91
Staples, 400 pounds	8.40
Clips, ½ inch, 976	24.50
Clips, 5/16 inch, 1,406	101.25
Brush and poles, 3,019.7 cords	4,227.58
Stone, 1,682 cubic yards	2,312.30
Steamboat expense	1,236.73
Labor, subsistence, and supervision	9,023.53
	17,960.88

Cost per linear foot, $22.50.
Cost per square, $9.
Cords of brush and poles per linear foot, 3.78.
Cords of brush and poles per square, 1.51.
Cubic yards of stone per linear foot, 2.11.
Cubic yards of stone per square, 0.84.
Cubic yards of stone per cord of brush and poles, 0.55.

Channel mat No. 10 (903 feet long by 250 feet wide, equaling 2,257.5 squares):

Strand, ½-inch, 12,931 pounds	365.95
Strand, 5/16-inch, 5,556 pounds	141.12
Strand, ¼-inch, 14,616 pounds	401.94
Wire, No. 12, 6,350 pounds	139.70
Wire, silicon bronze, 704 pounds	142.91
Staples, 450 pounds	9.45
Clips, ½-inch, 449	11.27
Clips, 5/16-inch, 544	18.73
Brush and poles, 3,589 cords	5,184.14
Stone, 1,825 cubic yards	2,924.72
Steamboat expense	1,400.00
Labor, subsistence and supervision	9,000.29
	19,740.22

Cost per linear foot, $21.86.
Cost per square, $8.74.
Cords of brush and poles per linear foot, 3.97.
Cords of brush and poles per square, 1.59.
Cubic yards of stone per linear foot, 2.021.
Cubic yards of stone per square, 0.808.
Cubic yards of stone per cord of brush and poles, 0.508.

Connecting mats Nos. 28 to 35, inclusive (573 squares):

Strand, ½-inch, 70 pounds	1.98
Strand, 5/16-inch, 3,395 pounds	60.83
Strand, ¼-inch, 6,054 pounds	160.49
Wire, No. 12, 1,700 pounds	37.40
Staples, 150 pounds	3.15

Connecting mats Nos. 28 to 35, inclusive, etc.—Continued.

Clips, ½-inch, 36	$1.40
Clips, 5/16-inch, 650	8.19
Brush and poles, 8,677 cords	1,214.78
Stone, 520 cubic yards	977.08
Steamboat expense	380.00
Labor, subsistence and supervision	2,801.34
	5,646.64

Cost per square, $9.85.
Cords of brush and poles per square, 1.51.
Cubic yards of stone per square, 0.91.
Cubic yards of stone per cord of brush and poles, 0.60.

Connecting mat No. 27, 181 squares (repairs to old work):

Strand, ½-inch, 420 pounds	11.88
Strand, 5/16-inch, 600 pounds	15.24
Strand, ¼-inch, 1,680 pounds	46.20
Wire, No. 12, 524 pounds	11.53
Staples, 50 pounds	1.05
Clips, ½-inch, 10	.25
Clips, 5/16-inch, 132	1.66
Brush and poles, 280 cords	396.00
Stone, 180 cubic yards	338.22
Steamboat expense	100.00
Labor, subsistence and supervision	1,082.00
	2,004.03

Cost per square, $11.07.
Cords of brush and poles per square, 1.54.
Cubic yards of stone per square, 1.
Cubic yards of stone per cord of brush and poles, 0.65.

Paving (1909 work) (7,897 square yards):

Stone, 1,768 cubic yards	3,322.07
Labor, subsistence and supervision	2,522.84
	5,844.91

Cost per square yard, $0.74.

It is impracticable to give the cost per linear foot on account of its being so scattered and detached.

Paving (1910 work) (2,149 linear feet, equaling 11,975 square yards):

Stone, 3,711 cubic yards	$6,054.51
Labor, subsistence and supervision	3,632.95
	9,687.46

Cost per square yard, $0.808.
Cost per linear foot, $4.50.
Cubic yards of stone per square yard of paving, 0.31.

Grading (2,149 linear feet, equaling 51,758 cubic yards):

Coal	570.08
Labor, subsistence and supervision	3,501.92
	4,072.00

Cost per linear foot, $1.89.
Cost per cubic yard, $0.0786.

Total field cost	64,956.14
Office expense	1,190.29
Surveys	440.16
Care of plant	1,069.18
Repairs to plant	5,102.85
Depreciation of plant	4,804.49
Total cost	77,563.11

Total unit cost:	
Channel mat, per linear foot	$26.59
Connecting mat, per linear foot	3.98
Grading, per linear foot	2.27
Paving, per linear foot	5.40
Total cost per linear foot of bank protected	38.24
Field cost per linear foot of bank protected	31.87

Plant.—The floating plant has been decreased during the year by the sinking of 1 material barge and 1 motor boat and the condemnation of 7 skiffs, and increased by the construction of 10 material barges, 6 of which were built by the New Orleans office and 4 at the Memphis fleet, and 2 mattress barges, which were also built at the fleet.

There is now under construction at the fleet the following-named plant: Two quarter boats, one hydraulic grader, one derrick boat, and two material barges. Four steel barges are under contract for construction at Ambridge, Pa.

The dredge *Wolf* and two dump scows which were reported in very bad condition on last report have been repaired and are now in condition for about two years' service.

The steamer *Minnetonka* was taken out on the marine ways at Mound City, Ill., and hull extensively repaired, the Memphis dock being too small for this purpose.

NEW PLANT.

Material barges *No. 1001*, *No. 1002*. *No. 1003*, and *No. 1004* cost	$16,968.00
Material barges (built at New Orleans) *No. 1007*, *No. 1008*, *No. 1009*, *No. 1010*. *No. 1011*, and *No. 1012* cost	25,479.51
Mattress barges *No. 1018* and *No. 1019* cost	9,285.82
Quarter boats *No. 1020* and *No. 1021*, under construction, cost to date	10,536.19
Hydraulic grader *No. 1022*, under construction, cost to date	3,143.25
Derrick boat *No. 1017*, under construction, cost to date	4,935.10
Material barges *No. 1005* and *No. 1006*, under construction, cost to date	4,358.42
Tools, appliances, outfits, etc., cost	12,821.48
Total	87,527.77

Description and cost of repairs to plant.

Steamer *Minnetonka:* Taken out on the ways at Mound City and hull thoroughly repaired below water line; guards, decks, splash bulkhead, cabin, and roof repaired at the fleet; the hull of this steamer has been salted	$12,377.59
Steamer *Chisca:* This steamer received repairs to cabin, wheel, boilers, decks, and machinery, and was painted	1,801.16
Steamer *Titan:* Received extensive repairs to boilers; also received repairs to wheel, cabin, decks, and machinery; a new searchlight was installed	5,480.44
Steamer *Graham:* Docked, hull calked and patched, chains tightened, wheel and machinery overhauled and repaired	922.47
Steamer *Itasca:* Received repairs to wheel, boilers, cabin, and machinery	876.78
Steamer *W. M. Rees:* Docked, hull repaired and calked; wheel, machinery, cabin, and decks repaired	721.20
Steam tender *No. 8:* Engines packed, valves ground, etc	75.00
Hydraulic grader *No. 2:* Received new stack and pile-driving leads; machinery overhauled and put in working order, hull calked afloat, decks patched	574.27
Hydraulic grader *No. 9313:* Received minor repairs to hull; machinery overhauled and put in working order	271.41
Pile driver *No. 6:* Hull calked afloat; machinery overhauled and put in working order	190.30
Pile driver *No. 9:* Leads removed and placed on grader *No. 2;* cabin enlarged, new pump installed, new stack made and put up, hull calked afloat	546.87

Derrick boat *No. 3:* Hull repaired and calked afloat, machinery overhauled and repaired, boom and sheaves repaired	$254.30
Dredge *Wolf:* Docked, hull thoroughly repaired; machinery, chains, dipper, boom, etc., overhauled and repaired	3,048.17
Quarter boat *No. 2:* Rakes calked	6.66
Quarter boat *No. 3:* Docked, hole in bottom repaired, rakes calked	128.71
Dump scow *No. 1:* Docked, received extensive repairs to bottom, sides, rakes, decks, and bins	666.55
Dump scow *No. 2:* Docked, received extensive repairs to sides, rakes, decks, bins, and bottom	670.32
Store boat *No. 8:* Constructing additional upper story, $1,499.56; repairs to hull, decks, cabin, etc., $432.79	1,972.35
Quarter boat *No. 11:* Received repairs to roof, deck, screens, stovepipes, etc.; boat painted inside	745.49
Quarter boat *No. 12:* Docked, received extensive repairs to bottom, rakes, and sides	1,138.05
Quarter boat *No. 25:* Docked, extensive repairs made to bottom, rakes, and sides; cabin repaired and painted	2,676.93
Carpenter shop *No. 26:* Received minor repairs to machinery, decks, etc., at various times	559.36
Quarter boat *No. 27:* Received minor repairs to hull and cabin; cabin painted	274.56
Quarter boat *No. 29:* Received repairs to hull, cabin, decks, roof, etc	392.09
Quarter boat *No. 206:* Boat painted and received minor repairs to cabin; rakes calked	382.33
Quarter boat *No. 221:* Boat painted, calked afloat, electric plant overhauled	414.42
Quarter boat *No. 0601:* Received minor repairs to cabin; rakes calked	79.12
Barge *No. 9301:* Deck and sides patched; calked afloat	116.08
Barge *No. 9303:* Docked; received repairs to bottom, rakes, and sides; calked	641.98
Barge *No. 9304:* Docked; received new stems and repairs to bottom, rakes, and sides; calked	747.39
Barge *No. 9305:* Docked; received repairs to rakes, sides, bottom, and deck; calked	973.59
Barge *No. 9306* (fascine): Calked and patched afloat	140.81
Barge *No. 9309:* Docked; received repairs to rakes, sides, and bottom; deck patched	412.41
Barge *No. 9310:* (fascine): Calked afloat; deck patched	145.97
Barge *No. 9315:* Sides, rakes, and deck repaired; calked afloat	198.74
Barge *No. 9317* (fuel): Docked; thoroughly calked	253.35
Barge *No. 9318* (mooring): Docked; bottom, sides, and rakes repaired; timber heads renewed; boat calked	432.90
Barge *No. 9319:* Docked; repaired sides, rakes, bottom, and deck; calked	559.47
Barge *No. 9323:* Calked afloat	52.35
Barge *No. 9324:* Deck patched	2.70
Barge *No. 9325:* Calked afloat	83.59
Barge *No. 9326:* Calked afloat; deck patched	152.89
Barge *No. 9327* (mooring): Docked; bottom, sides, and rakes repaired; timber heads renewed; boat calked	401.36
Barge *No. 9328* (fascine): Calked afloat	40.09
Barge *No. 9407:* Received minor repairs	10.55
Barge *No. 9408:* Deck patched	33.86
Barge *No. 0501:* Docked; sides, rakes, and bottom repaired and calked	427.05
Barge *No. 0502:* Docked; bottom, sides, and rakes repaired; hatch hoods built; stanchions put in	345.47
Barge *No. 0801:* Calked afloat; deck sheeted; hatch doors made and hung	196.91
Barge *No. 0802:* Docked; calked sides, rakes, and bottom; rakes repaired; deck sheeted; hatch doors made and hung	347.33
Barge *No. 0803:* Calked afloat; deck sheeted	147.06
Barge *No. 0804:* Docked; repaired stem and rake; calked sides and rakes; deck sheeted	234.99

Barge *No. 0805:* Calked afloat; deck patched; new timber head put in	$100.78
Barge *No. 0806* (cableway): Barge repaired and calked; cables, tower, and machinery repaired	510.22
Barge *No. 0807:* Deck sheeted; rake repaired; calked afloat	212.80
Barge *No. 0808:* Deck sheeted; calked afloat	145.76
Barge *No. 0809:* Deck sheeted; calked afloat; timber heads renewed	190.24
Barge *No. 0810:* Calked afloat; deck calked	127.06
Barge *No. 0811:* Calked afloat; deck calked and sheeted	274.20
Barge *No. 0901:* Received repairs to rake; deck sheeted	127.80
Barge *No. 0903:* Calked afloat; deck sheeted	170.34
Barge *No. 1002:* Calked afloat	54.83
Barge *No. 1003:* Calked afloat	10.65
Barge *No. 1004:* Deck repaired	19.94
Mooring barge *No. 1:* Calked afloat	43.30
Mooring barge *No. 2:* Calked afloat	45.57
Mooring barge *No. 9406:* Calked afloat	47.47
Mooring barge *No. 9409:* Calked afloat; deck repaired	115.29
Mattress barge *No. 9308:* Launching ways repaired	105.75
Mattress barge *No. 9312:* Calked afloat	68.68
Mattress barge *No. 5:* Docked and received repairs to bottom, sides, and ends; boat calked; deck repaired	1,081.49
Mattress barge *No. 6:* Repaired same as *No. 5*	1,141.36
Mattress barge *No. 0701:* Calked afloat; deck repaired	67.25
Mattress barge *No. 0703:* Calked afloat; deck repaired	79.96
Motor boat *Titania:* Received repairs at various times	189.90
Flats *No. 1*, *No. 2*, *No. 3*, and *No. 4:* Calked afloat; decks repaired, etc	299.05
Skiffs were overhauled, repaired, calked, and painted	250.79
Floating dock: Sides and ends were cut down afloat and rebuilt; gates rebuilt; sills and blocks repaired	3,040.00
Creosote tanks: Two wooden tanks built and lined with sheet iron, two steel tanks built; tanks moved and repaired	1,349.37
Machine-shop boat: Repairs to and lining up machinery; repairs to boilers, cabin, decks, etc	1,909.04
Miscellaneous: Repairs were made to tools and appliances at various times for construction parties, for fleet and office use, to ranges, stoves, wheelbarrows, furniture, blocks, bilge pumps, water-supply pipes, etc	3,557.22
Total repairs to plant	59,682.50

RECAPITULATION.

Care of plant	$12,504.98
Repairs to plant	59,682.50
New plant	87,527.77
Total	159,715.25

Statement of cost of plant and depreciation during the year ending Apr. 30, 1911.

Name.	No.	Original cost.	Valuation last year.	Repairs.	Depreciation.	Present value.
Barges, model	2	$7,500.00	$1,392.59	$44.41	$1,250.00	$187.00
Barges, decked	2	6,200.00	2,482.44	758.06	1,033.33	2,207.17
Do	6	19,020.00	5,791.49	2,618.91	3,170.00	5,240.40
Do	3	7,400.00	3,962.95	1,245.72	1,400.00	3,808.67
Do	2	6,340.00	1,675.47	55.06	1,056.67	673.85
Do	3	9,300.00	4,624.01	637.84	1,550.00	3,711.85
Do	1	3,370.00	1,716.21	427.05	2,143.26	(1)
Do	1	3,370.00	1,716.20	345.47	561.67	1,500.00
Do	1	3,170.00	2,074.58	40.09	528.33	1,586.34
Do	2	7,063.01	4,708.69	544.24	1,177.16	4,075.77
Do	4	22,498.81	17,249.08	993.05	1,499.92	16,742.21
Do	5	28,637.66	22,331.04	950.06	1,909.18	21,371.92
Do	2	11,139.16	9,735.55	298.14	742.61	9,291.08
Do	4	16,968.00		85.42	85.42	16,968.00
Do	6	25,479.51				25,479.51

(1) Sunk.

Statement of cost of plant and depreciation, etc.—Continued.

Name.	No.	Original cost.	Valuation last year.	Repairs.	Depreciation.	Present value.
Barges, mattress	2	$9,060.00	$730.34	$2,222.85	$1,510.00	$1,443.19
Do	2	5,600.00	8,845.16	174.43	1,706.66	7,312.93
Do	2	10,240.00	7,786.42	147.21	1,706.66	6,226.97
Do	2	9,285.82	....	....	....	9,285.82
Barges, mooring	2	4,046.00	7,309.57	88.87	1,582.41	5,816.03
Do	2	7,500.00	5,823.80	162.76	1,250.00	4,736.56
Barges, flat	1	460.00	225.37	75.00	150.00	150.37
Do	1	410.00	386.06	80.00	136.67	329.39
Do	1	496.00	191.32	75.00	165.33	100.99
Do	1	460.50	337.09	69.05	153.50	252.64
Dredge Wolf	1	8,000.00	2,494.62	3,048.17	800.00	4,742.79
Derrick boat No. 3	1	2,956.00	3,233.94	254.30	295.60	3,192.64
Scows, dump	2	6,572.00	2,123.23	1,336.87	1,336.87	2,123.23
Boats, quarter, Nos. 8, 11, 12	3	10,935.00	3,115.05	3,855.89	1,093.50	5,877.44
Boats, quarter, Nos. 25, 26	2	7,290.00	7,021.55	3,236.29	1,458.00	8,799.84
Boat, quarter, No. 27	1	2,788.00	3,525.20	274.56	577.60	3,222.16
Boat, quarter, No. 29	1	2,741.00	2,435.09	392.69	548.20	2,279.58
Boats, quarter, Nos. 206, 221	2	9,800.00	8,500.24	796.75	960.00	8,316.99
Boat, quarter, No. 0601	1	3,059.00	2,857.22	79.12	305.90	2,630.44
Hydraulic grader	1	30,232.00	5,595.83	574.27	666.84	5,503.26
Do	1	3,823.00	5,286.51	271.41	764.60	4,793.32
Floating dock	1	9,475.00	6,101.00	3,040.00	1,578.17	7,562.83
Machine-shop boat	1	8,501.00	3,513.92	1,909.04	850.00	4,572.96
Towboat Minnetonka	1	40,000.00	15,853.77	12,377.59	4,000.00	24,231.36
Towboat Chisca	1	25,900.00	22,176.06	1,801.16	2,590.00	21,387.22
Towboat Titan	1	23,500.00	26,083.98	5,480.44	2,350.00	29,214.42
Towboat Graham	1	9,500.00	12,571.36	922.47	950.00	12,543.83
Towboat Itasca	1	9,500.00	4,716.01	876.78	570.00	5,022.79
Steamer W. M. Rees	1	5,330.00	6,471.96	721.20	533.00	6,670.16
Pile drivers	2	4,435.00	6,726.68	737.17	443.50	7,020.35
Motor boat	1	810.07	790.55	189.90	980.45	(1)
Creosote tanks	2	1,349.37	....	1,349.37	600.00	749.37
Tools and appliances	....	46,668.43	43,652.05	3,557.22	4,966.84	42,242.43
Skiffs	21	857.50	476.31	250.79	274.75	452.35
Boats, quarter, and steam tender	....	....	....	210.37	210.37	....
Total	....	499,036.84	306,417.56	59,682.50	56,192.97	361,650.42

PART II—LEVEE WORK.

This work has been under the immediate charge of Junior Engineer Luther Y. Kerr, and this part of this report is compiled from data furnished in general by him.

Upper St. Francis Levee District (Cape Girardeau, Mo., to 70 R.).—(For reference to previous history, see Report Chief of Engineers, 1905, Supplement, p. 156, and 1907, vol. 3, p. 2685. See also plate No. 13, herewith.) At the beginning of the season there were three contracts in force. The details concerning these contracts are set forth in the following table:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
0/0 to 2/39	45 R. (above).	208,148	15.36	P. H. Rogers	Completed Dec. 10, 1910.
45/6 to 46/24	15 R.	98,000	16.24	Chas. W. Little	80 per cent completed.
46/24 to 47/6	16 R.	41,436	17.90	Roach & Stansell	Completed Nov. 14, 1910.

Included in the first contract above were 2.7 acres of grubbing at $100 per acre and 7.93 acres at $150 per acre. The United States placed a hired force on the work at stations 45/6 to 46/24 but the pit conditions became so bad that the work was discontinued December 31 with about 19,000 cubic yards yet to be placed. It is expected that this contract will be completed by the contractor during the dry part of the summer.

On August 8, 1910, bids were opened for work in this district, to be completed December 31, 1911, and paid from allotments made by the Mississippi River Commission, as follows: Thirty-five thousand dollars, April 20, 1910, from the $2,000,000 previously authorized by Congress and later appropriated by the sundry civil bill of June 25, 1910, and $75,000, June 25, 1910, from the river and habor act of same date.

The accepted bids are shown in detail in the following table:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
0/127	25 R. (above).	255,333	17.4	R. T. Clark & Co	19 per cent completed.
39/50 to 42/1	12 R.	94,000	16.0	Martin Jennings	20 per cent completed.
47/6 to 48/20	17 R.	58,000	16.9	W. L. Mosby	77 per cent completed.
48/20 to 50/23.	20 R.	85,000	15.5	Roach & Stansell	Completed.

The first contract in the above table is for a new levee being constructed to connect the levees of the Mississippi County districts Nos. 1 and 2 and is locally known as the Big Lake Crossing. When this work is completed there will be a continuous line of levee from a point about 4 miles below Commerce, Mo., to a point about 20 miles above New Madrid, Mo., a distance of about 55 miles. The other contracts are for enlargement.

Scott County district No. 2 is enlarging its levee to comply with the requirements of the Mississippi River Commission in regard to grade and section. It has added 49,712 cubic yards during the past season and intends to place under contract immediately 102,000 cubic yards, to be completed this season.

Mississippi County district No. 2 has enlarged about one-half of its front, 20,026 cubic yards having been placed, and expects to complete the remainder this season.

Mississippi County district No. 1 constructed a new loop at Bird Point, Mo., containing 66,338 cubic yards, at a cost of $11,859.88, and also paid for right of way near Crosno, Mo., $1,393.50.

Summary of earth in place.

Authority.	In place Apr. 30, 1910.	Added during year.	In place Apr. 30, 1911.	Under contract Apr. 30, 1911.
	Cubic yards.	*Cubic yards.*	*Cubic yards.*	*Cubic yards.*
United States	2,043,779	360,037	2,354,116	349,946
Levee boards	978,556	116,050	1,094,606	None.
Total	3,022,335	476,087	3,448,722	349,946

Thirty-five hundred and fifty linear feet of levee, containing 49,700 cubic yards, have been abandoned at Bird Point in front of the loop constructed by the levee board. This yardage was deducted in the above summary from amount in place April 30, 1911. There is no other point in the upper St. Francis district where the levee is endangered by caving and the general condition of this system is good.

Plate No. 13 shows the profile of the present levee with the references of two important high waters plotted thereon.

Reelfoot levee district (*36–60 L.*).—(For references to previous history see Reports, Chief of Engineers, 1905, supplement, p. 157, and 1908, pt. 3, p. 2737. See also plate No. 14 herewith.) At the beginning of the season there was one piece of work in progress in this district. By resolution of the Mississippi River Commission October 30, 1909, $10,000 was allotted for enlarging a part of that portion of this system lying in the State of Tennessee. Bids were opened November 30, 1909, and a contract subsequently made under this allotment for placing 35,000 cubic yards of enlargement, as shown in detail below.

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
16/40 to 18/40	55 L.	37,042	24.75	W. L. Mosby	Completed.

Ten thousand dollars was not sufficient to place this levee in good condition, but it was desired to improve the worst portion before the 1910 high water, the time limit for the contract being March 1, 1910. The exceptionally bad weather, however, upset calculations, and the work was so delayed that an early high water necessitated cessation of work and a waiver of the time limit after 13 per cent of the material had been placed.

Before this work could be resumed an additional allotment of $15,000 was made for this part of the levee, which is about 4 miles in length; the limits of the then existing contract were shortened and the cross section increased in order to make it more effective. The work, as modified, was completed September 30, 1910, and the section thus left out was included in the new contract, as is shown by the second piece in the following table.

Bids were opened June 18 and August 8, 1910, and contracts subsequently made for the expenditure of $15,000 and $10,000 for further work in this district. Details relative to these contracts are shown in the following table:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
3/40 to 4/42	39 L.	51,239	15.45	Roach & Stansell	Completed Mar. 6, 1911.
17/30 to 21/0	59 L.	60,000	23.7	W. L. Mosby	77 per cent completed.

The time limits on the above were February 1 and December 31, 1911, respectively. The second contract consists of difficult work, and heavy rains, together with an early high water, made it necessary to secure a waiver of the time limit and discontinue operations until the approaching summer. The local board in Kentucky expended $741.93 on general repairs to the levee.

Summary of earth in place.

Authority.	In place Apr. 30, 1910.	Added during year.	In place Apr. 30, 1911.	Under contract Apr. 30, 1911.
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*
United States	997,652	130,036	1,127,688	12,876
Levee board	585,770	None.	585,770	None.
Total	1,583,422	130,036	1,713,458	12,876

No levee has been lost or abandoned in this district during the season.

Plate No. 14 shows the profile of the present levee with the references of the 1909 high water platted thereon.

Lower St. Francis Levee district (*79–298 R.*).—(For references to previous history see Report, Chief of Engineers, 1908, Supplement, p. 157. See also plate No. 15, herewith.) At the beginning of the season there was one contract in force, to be completed by December 31, 1910, for enlarging the levee between stations 98/0 to 99/40 (185 R.), amounting to 74,134 cubic yards. The work, which included 1.64 acres of grubbing at $50 per acre, was completed October 18, 1910.

On August 8, 1910, bids were opened and contracts subsequently made for levee work in this district, to be paid for out of the allotments of $85,000 and

$100,000 made from appropriations in the sundry civil and river and harbor bills, respectively. Details of these contracts are shown in the table below:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
41/18 to 43/0	124 R.	54,652	17.9	Roach & Stansell	Completed Mar. 29, 1911.
45/0 to 46/15	127 R.	54,253	17.9	do	65 per cent completed.
46/15 to 47/31	126 R.	100,800	17.9	do	4 per cent completed.
99/40 to 101/0 [1]	188 R.	198,592	17.9	do	49 per cent completed.
129/0 to 133/0	210 R.	146,380	17.9	do	60 per cent completed.
133/0 to 134/0	212 R.	22,122	17.9	do	Completed Mar. 12, 1911.
134/0 to 135/0	213 R.	38,193	17.9	do	Completed Mar. 31, 1911.
135/0 to 137/0	215 R.	115,000	17.9	do	44 per cent completed.
140/0 to 141/0 [2]	218 R.	38,139	17.9	do	5 per cent completed.
148/0 to 149/0	227 R.	61,645	17.9	do	20 per cent completed.
149/0 to 151/0	235 R.	99,805	17.9	do	11 per cent completed.
		929,581			

[1] New levee. [2] Banquette.

This work is all covered with sufficient force and under ordinary conditions there is no reason why it should not all be completed within the contract time, which is December 31, 1911.

The following table shows the amount of work done during the past season and the amount under contract for the St. Francis Levee Board of Arkansas at the present time:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
57/0 to 65/35 [1]	150 R.	371,085	24.5	Canal Construction Co	72 per cent completed
208/0 to 209/0 [2]	283 R.	288,320	34.0	Roach & Stansell	Completed.
212/0 to 213/0 [2]	283 R.	224,516	26.0	do	99 per cent completed.

[1] Enlargement. [2] New levee.

This board, together with the St. Francis Levee Board of Missouri, has added to the levee during the past season 296,531 cubic yards at a cost of $78,315. Of this amount the Missouri board placed 8,118 cubic yards at 29½ cents. The Arkansas board has yet under contract 115,000 cubic yards, which will cost $51,590.

The original estimate of yardage, mile 213, was 83,246. The excess shown above is due to the subsidence of the foundation at the crossing of the Pillow Bayou.

Summary of earth in place.

Authority.	In place Apr. 30, 1910.	Added during year.	In place Apr. 30, 1911.	Under contract Apr. 30, 1911.
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*
United States	10,252,452	420,046	[1] 10,660,174	509,535
Levee boards	15,059,691	296,531	15,356,222	115,000
Total	25,312,143	716,577	26,016,396	624,535

[1] An additional 1,300 feet of levee, containing 12,324 cubic yards, was lost during the past year by caving at Point Pleasant, Mo., mile 0/0 to 0/30 (79 R.), and this amount has been deducted from the United States quantity shown in place Apr. 30, 1911.

The levee is threatened by caving banks at the following places:

Point Pleasant, Mo	79 R.
Linda, Mo	85 R.
Gayoso, Mo	106 R.
Caruthersville, Mo	110 R.
Golden Lake, Ark	189 R.
Porter Lake, Ark	260 R.
Walnut Bend, Ark	281 R.

The caving at Point Pleasant has now destroyed a total of 3,000 feet of the upper end of this system, and will necessitate abandoning all of the first mile. The United States proposed to loop this portion during 1909 and again in 1910, but the local authorities did not secure the right of way. The caving at this point has progressed to such an extent that it may be necessary to renew the first 5 miles of the system in a very short time. In view of this possible necessity, an investigation is being made to determine the advisability of abandoning the first 10¼ miles of the system, so as to begin the line at high ground just back of the town of Point Pleasant and run nearly due south to intersect the levee at about station 10/35, near Stewart, Mo.

Plate No. 15, herewith, shows the profile of the present levee with the references of several important high waters platted thereon.

Upper Yazoo Levee district (*244–365 L.*).—(For references to previous history, see Report, Chief of Engineers, 1905, Supplement, p. 158. See also Plate No. 17, herewith.) There was no contract in force in this district at the beginning of the season. On August 1, 1910, bids were opened for the construction of a new levee loop at Sunflower Landing (353 L.). Lowrance Bros. & Co. was the successful bidder at 20.4 cents per cubic yard, the time limit being December 31, 1910. Forty thousand dollars were allotted by the Mississippi River Commission June 25, 1910, to be applied to this construction.

The loop contained 280,917 cubic yards, of which the United States paid for 191,074 cubic yards and the Yazoo-Mississippi Levee Board the balance of 89,843 cubic yards. The entire work was done under the supervision of this office and completed January 17, 1911. The total cost of the work done by this board during the season was $59,767.01.

The levee is threatened by caving banks at Star Landing, Miss. (257 L.), Trotters Landing, Miss. (303 L.), and Sunflower Landing, Miss. (353 L.). Revetment work will be needed at Star Landing next year and at Sunflower during the coming season, the levee loop just completed at the latter place being only a temporary measure. The situation at Trotters Landing is not serious and a new loop will be easy in construction and reasonable in cost.

Summary of earth in place.

Authority.	In place Apr. 30, 1910.	Added during year.	In place Apr. 30, 1911.	Under contract Apr. 30, 1911.
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*
United States	7,495,682	191,074	7,686,756	None.
Levee board	22,948,076	240,265	[1] 22,947,641	None.
Total	30,443,758	431,339	30,634,397	None.

[1] Thirty-nine hundred feet of levee, containing 240,700 cubic yards, were abandoned in front of the Sunflower Loop. This has been deducted in computing the levee board yardage in place Apr. 30, 1911, as stated above.

Plate No. 17 shows the profile of the present levee with the references of two high waters platted thereon.

White River levee district (*306–385 R.*).—(For references to previous history see Report Chief of Engineers, 1905, Supplement, p. 159. See also plate No. 16, herewith.) At the beginning of this season there were no uncompleted contracts in this district, and on June 18 bids were opened for enlarging between stations 9/45 to 11/49. On August 8 bids were opened and contracts were subsequently made for levee work, to be paid for out of allotments of $50,000 from the sundry civil bill and $60,000 from the river and harbor bill of 1910. Details of these contracts are shown in the following table:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
9/45 to 11/49	316 R.	100,000	15.8	Roach & Stangell	82 per cent completed.
15/0 to 16/8	322 R.	114,285	29.0	Geo. R. Lacy & Co.	11 per cent completed.
37/40 to 39/10	344 R.	100,000	26.4	do	9 per cent completed.
Total		314,285			

Details of a contract by the Cotton Belt levee district No. 1 of Phillips County, Ark., are given below:

Location.	Miles below Cairo.	Actual cubic yards.	Price.	Contractor.	Remarks.
			Cents.		
20/11 to 22/0	326 R.	150,000	17.8	Roach & Stansell	Completed.

This contract was in force with 20 per cent in place April 30, 1910, its cost being estimated at $28,306.08. In addition to making this contract this board has expended $4,289 for right of way.

The Laconia levee district expended $3,873.21 on general repairs.

Summary of earth in place.

Authority.	In place Apr. 30, 1910.	Added during year.	In place Apr. 30, 1911.	Under contract Apr. 30, 1911.
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*
United States	9,053,962	193,826	9,247,788	243,344
Levee boards	1,976,319	122,000	2,098,319	None.
Total	11,030,281	315,826	11,346,107	243,344

No levee was lost or abandoned on account of caving banks or new loops.

The caving below Fergusons (365 R.) has been more rapid during the past season and a new loop will be required at this point soon.

The levee machine, operating near Modoc, Ark., has worked more nearly satisfactorily this season than formerly. The electric lighting plant installed last spring has been very satisfactory. During the six months beginning with October and ending early in April, 69,953 cubic yards were placed at an average cost of 19.3 cents.

Work by levee machine.

Location.	Miles below Cairo.	Actual cubic yards.	Cost per cubic yard.
			Cents.
24/20 to 24/46	333 R.	69,953	19.3

Plate No. 16 shows the profile of the present levee with the elevations of two important high waters plotted thereon.

Miscellaneous.—The river reached a stage of 45.4 at Cairo, April 21, and all levee construction south of that point was temporarily discontinued, but no high-water work was necessary.

The levees generally, although they are deficient in section, are otherwise in excellent condition.

The following table shows the amount expended by the United States in the various districts for the year ending April 30, 1911:

District.	Total expended.	Construction.	Engineering and local inspection.	Maintenance and repairs.	Surveys.	Office.	General inspection.	Levee machine.
		Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Upper St. Francis	$59,390.82	91.0	7.1	1.3	0.4	0.1	0.1	
Lower St. Francis	63,373.80	86.4	8.1		1.8	3.6	.1	
White River	45,060.53	40.1	5.1		.2	1.7	.1	52.8
Reelfoot	28,885.65	93.3	6.3	.1		.3		
Upper Yazoo	40,080.00	97.3	1.9		.2	.6		
Levee machine	23,785.36							
Total	260,496.16							

Five per cent of the cost of care, repair, and depreciation of plant is chargeable to levees, and this is prorated to each district according to the total mileage of existing levees, as shown in the following table:

District.	Length of district.	Miles of levee.	Care of plant.	Repair of plant.	Depreciation of plant.
	Miles.				
Upper St. Francis	90	55.0	$71.42	$340.86	$320.94
Reelfoot	21	21.0	27.27	130.15	122.54
Lower St. Francis	212	207.5	269.45	1,285.99	1,210.81
Upper Yazoo	124	124.0	161.02	768.50	723.56
White River	74	74.0	96.09	458.62	431.80
Total	521	481.5	625.25	2,984.12	2,809.65

PART III.—SURVEYS.

The annual surveys were made between August, 1910, and January, 1911, under the immediate charge of Junior Engineer L. L. Griffith, and data in general for this part of this report was furnished by him.

Slough Landing Neck, Ky. and Tenn. (*60 L.*).—(See plate No. 3.) The results of the survey here are shown on the map of Point Pleasant Reach, accompanying, and continued caving is indicated on both sides of the neck. On the upper side the greatest caving during the year was 300 feet, and the average caving 150 feet. In the upper part of the bend several small sand bars have appeared, which shows the tendency of the channel to cut across the point of the bar and lower the point of attack in the bend. On the lower side of the neck the greatest caving during the year was 1,000 feet in the bight of the bend, decreasing toward the head and foot of the bend to no caving. The shortest distance across the neck between the caving bends is 6,300 feet as against 7,100 feet last year, showing a reduction of 800 feet in the width of the neck during the year.

New Madrid, Mo. (*70 R.*).—(See plate No. 3.) The soundings show a fill of 5 feet in the channel opposite the revetment on nearly all the ranges, but on the mats there has been no change.

Point Pleasant Reach (*75 to 85 miles below Cairo*).—(See plate No. 3.) A survey of this reach was made in order to have recent data on which to base plans for contraction work to prevent, if possible, the excessive amount of dredging that has been necessary in this reach. The survey was made as part and continuation of the survey of Slough Landing Neck. The portion of the river shown on map No. 3, herewith, viz: from Slough Landing, Tenn. (60 miles below Cairo), to Tiptonville, Tenn. (85 miles below Cairo), a distance of 25 miles in 1880, has increased in length 5 miles, one-fifth of its length, in 30 years, and as a result the water at stages from 15 feet and higher on the New Madrid gauge shows a decided tendency to cut through the bar at Watsons Point, also back of the bar made out from Toneys Towhead, and through the chute from Point Pleasant, Mo., to Linda, Mo. In the last-named chute active caving threatens nearly 2 miles of controlling levee. The survey did not cover the bend below New Madrid, as there is practically no caving there, and the tendency to cut across that bend is noted from observation only. Water begins to flow through the chute at Toneys Towhead at 15 feet, and at all higher stages there is a strong draw through this chute. Actively caving banks characterize the balance of the reach, except for about a mile below Point Pleasant, where a secondary bank grown up in willows still holds.

Caruthersville, Mo. (*110 R.*).—(See plate No. 4.)[1] The cross sections over the revetment show a tendency to fill; the changes during the past year, however, have been very small and do not indicate any disturbance of the revetment. The caving above and below the work continues very slowly.

Plum Point Reach (*147 to 168 miles below Cairo*).—Plate No. 5[1] shows changes in Plum Point Reach since 1904. The changes during the past year are given in detail as follows:

(a) *Chute of Island 26* (*150 L.*).—(See plate No. 5.)[1] The shore line and soundings indicate small changes in this chute during the year. The chute has been navigable throughout the year, but it is evident that the larger volume of water still flows around the bend.

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[1] Not printed.

(b) *Daniels Point, Ark.* (*152 R.*).—(See plate No. 5.)[1] Caving continues slowly above the revetment work and in the unprotected pockets at the lower end of the work. Various scours and fills are taking place over the balance of the revetment, but there are no indications of any damage to the mattresses. The ranges across the river show a small decrease in area of the cross sections.

(c) *Ashport Bend, Tenn.* (*154 to 157 L.*)—(See plate No. 5.)[1] Soundings were made over the lower 2,000 feet of the revetment only, as the upper part of the bend is filling rapidly. The breaks in the revetment at its lower end reported last year shows practically no change. The caving from the lower end of the revetment to the head of Gold Dust Chute has been light during the year, but late reports indicate that it has become active since the survey was made.

(d) *Gold Dust Chute* (*158 to 164 L.*).—(See plate No. 5.)[1] The only change in this chute during the past year is the shifting of the channel on some ranges; the area of the cross sections remains about the same. The only caving in the chute is at Plum Point, near the mouth of the chute, and a small recession of the top bank on Island 30.

(e) *Fletchers Bend, Ark.* (*158 to 161 R.*).—(See plate No. 5.)[1] On account of the unstable crossing at the head of this work, the soundings over the upper end of the revetment show various changes from year to year, but do not indicate any damage to the revetment. In the vicinity of the large pocket, near the middle of the work, which was repaired in 1908, and again in 1909, the cross sections show a continued scour both on the mats and in the channel. This scour varies from 5 to 10 feet on the mats and from 2 to 20 feet in the channel, extending from range 34 to range 36, affecting 4,600 feet of the revetment work. On the lower 5,000 feet of the work there has been no change.

(f) *Osceola Bars, Ark.* (*165 R.*).—(See plate No. 5.)[1] The soundings over this revetment show a decided fill of from 5 to 25 feet over the entire work. The caving continues at the lower end at a decreased rate. At the upper end there has been no caving during the past year.

(g) *Bullerton Towhead, Ark.* (*168 R.*).—(See plate No. 5.)[1] The greatest change in the reach during the year occurred at this point, and consists in the disappearance of the bar from the upper half of the revetment. This revetment has been covered by a sand bar for about seven years, but may all be exposed again after the next high water. The increasing amount of water flowing through Gold Dust Chute is probably the cause of forcing the current into this bend.

Bend of Island 35 (*186 to 196 R.*).—(See plate No. 6.)[1] A shore line survey of this bend and the chute of Island 35 shows continued caving in certain places throughout the bend and some caving at the lower end of the chute. The chute, however, does not appear to be deepening, and on account of the direction of flow at the head of the chute it is thought there is no danger of the channel transferring to the chute. The channel back of the towhead in the bed is enlarging and a bar is forming in the lower end of the bend.

Memphis Reach (*221 to 240 miles below Cairo*).—(See plate No. 7). This survey extends from the foot of Island 40 to the foot of Presidents Island, and is the first complete survey of the entire reach in five years. There has been no change in the length of the channel in this reach, although the caving in the bend on the Tennessee side above Memphis has been excessive. Probably the greatest change in the last 27 years in this vicinity was the transfer of the channel from the bend of Island 40 to the chute of Island 40, by which the length of channel was decreased 4 miles from its former length of 8 miles around the bend. This shortening no doubt is directly responsible for the active caving in the bend upstream from Memphis, on the Tennessee side, and accounts for the strong current and numerous breaks in the revetment in Hopefield Bend. The total amount of caving in the bend above Memphis referred to has been 7,500 feet in eight years, or nearly 1,000 feet per year. The channel on both sides of Presidents Island is used for navigation purposes. Through the old river channel the bank caves slowly on the Arkansas side; this channel becomes narrow and shoal at the foot of the island during low water. The channel through Tennessee Chute becomes narrow just below the mouth of Nonconnah Creek during low stages.

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[1] Not printed.

Hopefield Bend, Ark. (*227–230 R.*).—(See plate No. 7). Two pockets appeared at about range 70 east in April, 1910, which the survey of May, 1910, proved to be a break in the revetment at this point. This break followed a 33-foot stage on the Memphis gauge in March, and is 3,000 feet farther downstream than similar breaks in 1907. This shows that the point of attack, due to the caving in the bend above on the opposite side of the river, is moving downstream along the Hopefield revetment. The fill at the upper end of the revetment continues at an increased rate, varying from 10 to 30 feet during the past year, and has advanced downstream 1,600 feet. This fill now partially protects the upstream 5,400 feet of the Hopefield revetment.

Memphis bar and revetment (*229–232 L.*).—(See plate No. 7.) The cross sections in front of the bar and over the revetment show the effect of the increased current all along the Memphis front from the mouth of Wolf River to the bridge. The zero contour of the bar has receded from 60 to 150 feet and the slope of the cross sections over and opposite the bar show a scour of from 5 to 45 feet, while the soundings in the channel on the same ranges show a fill of from 10 to 25 feet. The scour on the slope of the cross sections from the downstream end of the bar to the bridge has been from 5 to 20 feet and the fill in the channel varies from 5 to 25 feet. These changes are due to those taking place above Memphis, and the scour on the slope of the cross sections has so far only removed previous fills and has not impaired the effectiveness of the protection work.

Star Landing, Miss. (*257 L.*).—(See plate No. 8.)[1] The rate of caving here since the last report has increased from 300 feet per year to about 400 feet during the past year. Since the survey, caving has continued at an increased rate.

Porter Lake, Ark. (*261 R.*).—(See plate No. 8.)[1] The rate of caving has increased during the past year at a point upstream from Fritz Landing, being at the rate of 200 feet per year. The hard point at the mouth of Lost River Bayou still holds and there has been no caving below this point. The shortest distance to the levee, reported last year as 900 feet, remains the same.

Walnut Bend, Ark. (*276–284*).—(See plate No. 9.) The soundings show a scour in the channel along the toe of the mats at a point just downstream from the center of the completed revetment, amounting to from 5 to 20 feet. There are no changes that indicate any damage to the revetment.

Helena reach (*303 to 308 miles below Cairo*).—(See plate No. 10.)[1] The survey of the reach consists of shore-line location in Trotters Bend, which shows light caving, and soundings above the revetment to determine the depths in that vicinity.

Helena revetment, Ark. (*307 R.*).—(See plate No. 10).[1]—The soundings over the revetment show a scour of 10 to 20 feet on ranges 26 to 32, but on range 32 only does the section go below the original section and indicate a break or settlement. On the balance of the work there has been no change.

Old Town, Ark. (*325 R.*).—(See plate No. 11.)[1] A scour of 10 feet on range 104, showing a settling or scour through the mat, is the only change in the cross sections since last report.

Sunflower Bend, Miss. (*352–357 L.*).—(See plate No. 12.)[1] A shore-line survey shows the caving during the past year to have been 300 feet in the upper part of the bend and 500 feet in the lower part of the bend, while in the bight of the bend there has been no recession. An inspection on May 18, 1911, showed that the shortest distance from the caving bank to the new loop near Hushpucana Bayou is about 300 feet.

The following table shows the cost of surveys from May 1, 1910, to April 30, 1911.

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[1] Not printed.

Cost of surveys from May 1, 1910, to April 30, 1911.

	Days.	Services.	Subsistence.	Supplies.	Coal.	Drafting room.	Repair of instruments.	Transportation.	Total.
Office work	232	....	....	....	....	$3,795.54	....	....	$3,795.54
Slough Landing Neck	5	$88.70	$33.50	$13.40	$21.25	20.85	$0.80	$0.95	179.45
New Madrid, Mo	3	53.22	20.10	8.04	12.75	27.80	.48	.57	122.96
Point Pleasant Reach	14	248.36	93.80	37.52	59.50	55.60	2.24	2.66	499.68
Gayoso to Caruthersville	3	53.22	20.10	8.04	12.75	34.75	.48	.57	129.91
Caruthersville, Mo	5	88.70	33.50	13.40	21.25	27.80	.80	.95	186.40
River Styx, Ark	0½	8.87	3.35	1.34	2.12	....	.08	.09	15.85
Chute of Island 26	4	70.96	26.80	10.72	17.00	....	.64	.76	126.88
Daniels Point, Ark	5	88.70	33.50	13.40	21.25	13.90	.80	.95	172.50
Plum Point Reach	9	159.66	60.30	24.12	38.25	62.55	1.44	1.71	348.03
Ashport Bend, Tenn	1½	26.61	10.05	4.02	6.38	13.90	.24	.29	61.49
Fletchers Bend, Ark	5	88.70	33.50	13.40	21.25	27.80	.80	.95	186.40
Chute of Island 30	1	17.74	6.70	2.68	4.25	....	.16	.19	31.72
Osceola Bars, Ark	2	35.48	13.40	5.36	8.50	13.90	.32	.38	77.34
Bullerton Towhead	3	53.22	20.10	8.04	12.75	....	.48	.57	95.16
Golden Lake Bend	5	88.70	33.50	13.40	21.25	20.85	.80	.95	179.45
Hopefield Bend	4½	79.83	30.15	12.06	19.12	34.75	.72	.85	177.48
Memphis Reach	17	301.58	113.90	45.56	72.25	132.05	3.34	4.17	672.85
Memphis Harbor, Tenn	7½	133.05	50.25	20.10	31.88	34.75	1.20	1.43	272.66
Tennessee Chute	6	106.44	40.20	16.08	25.50	20.85	.96	1.14	211.17
Star Landing, Miss	3	53.22	20.10	8.04	12.75	20.85	.48	.57	116.01
Porter Lake, Ark	5	88.70	33.50	13.40	21.25	27.80	.80	.95	186.40
Walnut Bend, Ark	7½	133.05	50.25	20.10	31.87	48.65	1.20	1.42	286.54
Trotters Bend	1½	26.61	10.05	4.02	6.38	....	.24	.29	47.59
Helena, Ark	5	88.70	33.50	13.40	21.25	27.80	.80	.95	186.40
Westover, Ark	1	17.74	6.70	2.68	4.25	....	.16	.19	31.72
Old Town, Ark	6½	115.31	43.55	17.42	27.62	41.70	1.04	1.23	247.87
Sunflower, Miss	2½	44.43	17.28	6.47	10.77	....	.40	.48	79.83
	365	2,359.50	891.63	356.21	565.39	4,504.44	21.90	26.21	8,725.28

NOTE.—While this table shows the total cost of surveys made during the year, the cost of such surveys as were made in connection with river-improvement work was paid from the respective allotments for such work.

INCLOSURES.

The following inclosures accompany this report, of which they are parts:

[1] Plate No. 1.—District map, first district.
[1] Plate No. 2.—District map, second district.
Plate No. 3.—Slough Landing Neck, New Madrid, Mo., and Point Pleasant, Mo.
[1] Plate No. 4.—Caruthersville, Mo.
[1] Plate No. 5.—Plum Point Reach.
[1] Plate No. 6.—Bend of Island 35.
Plate No. 7.—Hopefield Bend and Memphis Harbor.
Plate No. 8.—Star Landing and Porter Lake.
Plate No. 9.—Walnut Bend.
[1] Plate No. 10.—Helena Reach.
[1] Plate No. 11.—Old Town, Ark.
[1] Plate No. 12.—Sunflower Bend, Miss.
Plate No. 13.—Upper St. Francis levee district.
Plate No. 14.—Reelfoot levee district.
Plate No. 15.—Lower St. Francis levee district.
Plate No. 16.—White River levee district.
Plate No. 17.—Upper Yazoo levee district.

Money statements and abstract of contracts in force will be forwarded July 1.

Very respectfully, your obedient servant,

CLARKE S. SMITH,
Captain, Corps of Engineers.

To the PRESIDENT OF THE MISSISSIPPI RIVER COMMISSION.

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[1] Not printed.

MONEY STATEMENT.

Appropriation for improving Mississippi River, first and second districts.

NEW MADRID, MO.

July 1, 1910, balance unexpended	$1,702.14
July 1, 1911, balance available	1,702.14

PLUM POINT REACH.

July 1, 1910, balance unexpended	13,329.70
June 30, 1911, amount expended during fiscal year	1,124.55
July 1, 1911, balance available	12,205.15

GOLDEN LAKE, ARK.

Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved Feb. 27, 1911	105,000.00
July 1, 1911, balance unexpended	105,000.00
July 1, 1911, outstanding liabilities	5,000.00
July 1, 1911, balance available	100,000.00

HOPEFIELD BEND.

July 1, 1910, balance unexpended		9,643.28
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910		50,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910		25,000.00
		84,643.28
Amount transferred to secretary, Mississippi River Commission (in payment for coal)	$2,023.35	
June 30, 1911, amount expended during fiscal year	45,355.00	
		47,378.35
July 1, 1911, balance unexpended		37,264.93
July 1, 1911, outstanding liabilities		264.93
July 1, 1911, balance available		37,000.00

WOLF RIVER.

Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	10,000.00
June 30, 1911, amount expended during fiscal year	2,226.83
July 1, 1911, balance unexpended	7,773.17
July 1, 1911, balance available	7,773.17

PORTER LAKE, ARK.

Amount allotted from appropriation for improving Mississippi River (river and harbor act approved Feb. 27, 1911)	105,000.00
July 1, 1911, balance unexpended	105,000.00
July 1, 1911, outstanding liabilities	5,000.00
July 1, 1911, balance available	100,000.00

WALNUT BEND.

July 1, 1910, balance unexpended		$1,644.41
Amount allotted from appropriation for improving Mississippi River (sundry civil act approved June 25, 1910)		55,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act approved June 25, 1910)		75,000.00
		131,644.41
Amount transferred to secretary Mississippi River Commission (in payment for coal)	$6,096.36	
June 30, 1911, amount expended during fiscal year	122,356.87	
		128,453.23
July 1, 1911, balance unexpended		3,191.18
July 1, 1911, outstanding liabilities		591.18
July 1, 1911, balance available		2,600.00

OLD TOWN BEND.

July 1, 1910, balance unexpended		7,718.01
Amount allotted from appropriation for improving Mississippi River (sundry civil act approved June 25, 1910)		30,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act approved June 25, 1910)		40,000.00
		77,718.01
Amount transferred to secretary Mississippi River Commission (in payment for coal)	$5,625.31	
June 30, 1911, amount expended during fiscal year	64,989.20	
		70,614.51
July 1, 1911, balance unexpended		7,103.50
July 1, 1911, outstanding liabilities		103.50
July 1, 1911, balance available		7,000.00

SUNFLOWER, MISS.

Amount allotted from appropriation for improving Mississippi River (river and harbor act approved Feb. 27, 1911)	140,000.00
June 30, 1911, amount expended during fiscal year	
July 1, 1911, balance unexpended	140,000.00
July 1, 1911, outstanding liabilities	10,000.00
July 1, 1911, balance available	130,000.00

REPAIRS TO EXISTING WORKS AND STONE.

Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910	40,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	70,000.00
	110,000.00
June 30, 1911, amount expended during fiscal year	7,085.48
July 1, 1911, balance unexpended	102,914.52
July 1, 1911, outstanding liabilities	5,512.29
July 1, 1911, balance available	97,402.23

GENERAL REPAIRS AND STONE.

Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved Feb. 27, 1911	$100,000.00
July 1, 1911, balance available	100,000.00

UPPER ST. FRANCIS LEVEE DISTRICT.

July 1, 1910, balance unexpended	37,176.95
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910	35,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	75,000.00
	147,176.95
June 30, 1911, amount expended during fiscal year	79,446.49
July 1, 1911, balance unexpended	67,730.46
July 1, 1911, outstanding liabilities	52,500.47
July 1, 1911, balance available	15,229.99

REELFOOT LEVEE DISTRICT.

July 1, 1910, balance unexpended	9,019.55
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910	15,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	10,000.00
June 12, 1911, amount refunded on account of overpayment in voucher 57, February, 1911	1.00
	34,020.55
June 30, 1911, amount expended during fiscal year	28,957.02
July 1, 1911, balance unexpended	5,063.53
July 1, 1911, outstanding liabilities	4,140.27
July 1, 1911, balance available	923.26

LOWER ST. FRANCIS LEVEE DISTRICT.

July 1, 1910, balance unexpended	19,665.54
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910	85,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	100,000.00
May 15, 1911, amount refunded on account of overpayment in voucher 89, December, 1910	.25
	204,665.79
June 30, 1911, amount expended during fiscal year	99,557.55
July 1, 1911, balance unexpended	105,108.24
July 1, 1911, outstanding liabilities	90,270.31
July 1, 1911, balance available	14,837.93

WHITE RIVER LEVEE DISTRICT.

July 1, 1910, balance unexpended		$951.64
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910		50,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910		60,000.00
Amount accepted in compromise of claim against the Talley-Bates Construction Co., on account of levee work (E. D. 55918/35)		2,000.00
Amount refunded on account of overpayment in voucher 29, May, 1910		.03
		112,951.67
Amount transferred to secretary Mississippi River Commission (in payment for coal)	$861.84	
June 30, 1911, amount expended during fiscal year	56,939.99	
		57,801.83
July 1, 1911, balance unexpended		55,149.84
July 1, 1911, outstanding liabilities		53,448.01
July 1, 1911, balance available		1,701.83

UPPER YAZOO LEVEE DISTRICT.

Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	40,000.00
June 30, 1911, amount expended during fiscal year	40,000.00

SURVEYS, FIRST AND SECOND DISTRICTS.

July 1, 1910, balance unexpended		413.13
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910		5,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved Feb. 27, 1911		5,000.00
June 27, 1911, amount received from sale of blue print		.25
		10,413.38
Amount transferred to secretary Mississippi River Commission (in payment for coal)	$301.76	
June 30, 1911, amount expended during fiscal year	4,467.31	
		4,769.07
July 1, 1911, balance unexpended		5,644.31
July 1, 1911, outstanding liabilities		100.00
July 1, 1911, balance available		5,544.31

PLANT, FIRST AND SECOND DISTRICTS.

July 1, 1910, balance unexpended	2,278.27
Amount allotted from appropriation for improving Mississippi River (sundry civil act), approved June 25, 1910	50,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910	50,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved Feb. 27, 1911	65,000.00
Amount allotted from sale of United States engineer property (E. D. 71519/21)	174.75
Dec. 22, 1910, amount refunded on account of overpayment in voucher 65, August, and voucher 100, September, 1910	100.05
May 15, 1911, amount refunded on account of overpayment in voucher 10, December, 1910	.50
	157,553.57

Amount transferred to appropriation for improving Mississippi River from mouth of Ohio River to Minneapolis, Minn. (between mouths of Ohio and Missouri Rivers, for rent of plant) (E. D. 68400/18)	$2,190.00	
Amount transferred to appropriation for improving Mississippi River from mouth of Ohio River to Minneapolis, Minn. (between mouths of Ohio and Missouri Rivers), being difference in money value of property transferred between the St. Louis and Memphis districts (E. D. 68400/23)	126.60	
Amount Treasury settlement No. 12920, being amount paid Chicago, Rock Island & Pacific R. R. for freight on incinerator (E. D. 16574/1254)	13.34	
Amount transferred to secretary Mississippi River Commission (in payment for coal)	1,538.25	
June 30, 1911, amount expended during fiscal year	103,384.66	
		$107,252.85
July 1, 1911, balance unexpended		60,300.72
July 1, 1911, outstanding liabilities		10,000.00
July 1, 1911, balance available		50,300.72

NEW PLANT.

Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved June 25, 1910		185,000.00
Amount allotted from appropriation for improving Mississippi River (river and harbor act), approved Feb. 27, 1911		222,000.00
		407,000.00
Amount transferred to appropriation for improving Mississippi River, fourth district, to cover cost of construction of 6 creosoted barges for Memphis district	$25,956.41	
Amount transferred to plant, third district (I. M. R.), to reimburse that district for towing 6 barges belonging to this district from Vicksburg, Miss., to Memphis, Tenn	1,025.00	
June 30, 1911, amount expended during fiscal year	40,116.28	
		67,097.69
July 1, 1911, balance unexpended		339,902.31
July 1, 1911, outstanding liabilities		41,600.00
July 1, 1911, balance available		298,302.31

Abstracts of contracts in force June 30, 1911, Mississippi River Commission, first and second districts.

Names of contractors.	Amount and character of work.	Rate.	Date of approval.	Date of beginning work.	Date of expiration of contract.
The West Memphis Packet Co.	Rent of river front opposite Memphis, Tenn., 3.72 acres.	$20 per acre per year.	Lease	July 1, 1910	June 30, 1911
Wm. M. Randolph	Rent of river front opposite Memphis, Tenn., 0.87 acres.	do	do	do	Do.
Chas. H. Boyle	Rent of river front at Memphis, Tenn.	$50 per year	do	Apr. 1, 1911	Mar. 31, 1912
G. W. Fisher	do	do	do	do	Do.
Upper St. Francis levee district:					
Chas. W. Little	90,000 cubic yards levee work, station, $\frac{41}{8}$ to $\frac{11}{12}$.	16.24 cents per cubic yard.	Sept. 1, 1909	Nov. 3, 1909	Dec. 1, 1910[1]
Do	1 acre light grubbing	$100 per acre			
R. T. Clarke & Co.	255,333 cubic yards levee work, station, 0 to 127.	17.4 cents per cubic yard.	Oct. 15, 1910	Mar. 10, 1911	Dec. 31, 1911
Do	13 acres grubbing	$140 per acre.			
Martin Jennings	94,000 cubic yards levee work, station, $\frac{11}{12}$ to $\frac{42}{1}$.	16 cents per cubic yard.	do	Mar. 8, 1911	Do.
Do	2 acres grubbing	$50 per acre			

[1] Time limit waived.

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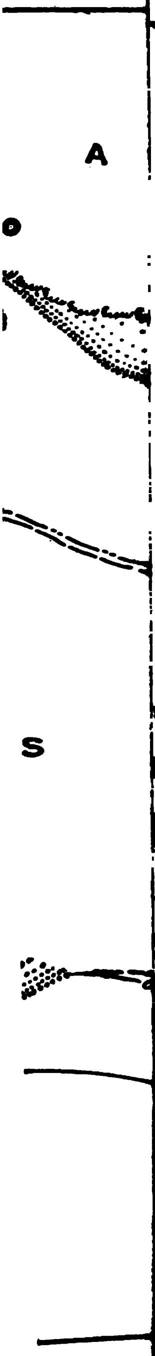

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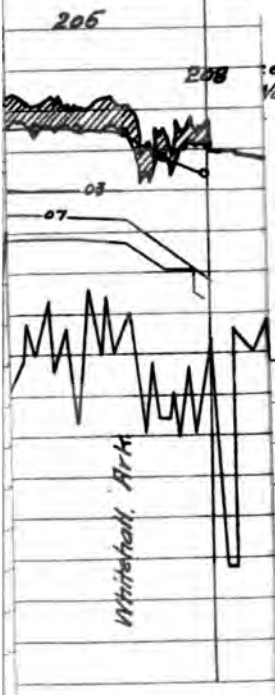

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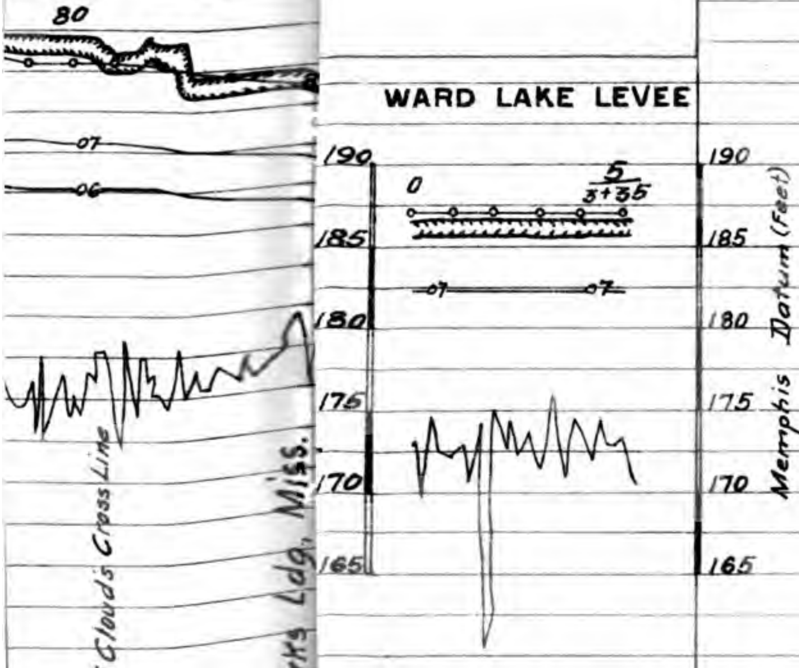

AZOO LEVEE DISTRICT

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House Doc. 129; 62d Cong. 2d Sess.

Abstracts of contracts in force June 30, 1911, etc.—Continued.

Names of contractors.	Amount and character of work.	Rate.	Date of approval.	Date of beginning work.	Date of expiration of contract.
Reelfoot levee district:					
W. L. Mosby...	60,000 cubic yards levee work, station, [illegible] to [illegible].	23.7 cents per cubic yard.	July 27, 1910	Sept. 22, 1910	Feb. 1, 1911[1]
Do.........	2 acres grubbing......	$150 per acre...			
Lower St. Francis levee district:					
Roach & Stanwell.	51,000 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	....	Nov. 16, 1910	
Do.........	1¼ acres grubbing.....	$75 per acre...			
Do.........	50,000 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	Oct. 15, 1910	Feb. 15, 1911	Dec. 31, 1911
Do.	2¼ acres grubbing.....	$75 per acre....			
Do.	100,800 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	....	Apr. 3, 1911	
Do.........	3½ acres grubbing....	$75 per acre....			
Do....... ..	200,000 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	Oct. 15, 1910	Sept. 21, 1910	Do.
Do.........	13 acres grubbing.....	$175 per acre...			
Do.........	123,000 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	....do.......	Oct. 1, 1910	Do.
Do.........	1½ acres grubbing.....	$75 per acre...			
Do.........	115,000 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	....do.......	Jan. 19, 1911	Do.
Do.........	1 acre grubbing.......	$75 per acre....			
Do.........	44,300 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	....do.......	Apr. 7, 1911	Do.
Do.........	3½ acres grubbing.....	$175 per acre...			
Do.........	58,200 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	.....do.......	Mar. 6, 1911	Do.
Do.........	101,707 cubic yards levee work, station, [illegible] to [illegible].	17.9 cents per cubic yard.	Oct. 15, 1910	Mar. 16, 1911	Do.
Do.........	3 acres grubbing......	$175 per acre...			
White River levee district:					
Geo. R. Lacy & Co.	114,285 cubic yards levee work, station, [illegible] to [illegible].	29 cents per cubic yard.	....do.......	Mar. 2, 1911	Do.
Do.........	4 acres grubbing......	$65 per acre...			
Do.........	100,000 cubic yards levee work, station, [illegible] to [illegible].	26.4 cents per cubic yard.	....do.......	Jan. 11, 1911	Do.
Do.........	2 acres grubbing......	$65 per acre...			
W. B. Arnold...	25,000 cubic yards riprap stone.	75 cents per cubic yard.	Apr. 11, 1911	May 10, 1911	July 11, 1911
American Bridge Co.	4 steel barges.........	$8,900 each....	May 31, 1911	....	June 1, 1912

[1] Time limit waived.

APPENDIX 3.

REPORT OF CAPT. J. A. WOODRUFF, CORPS OF ENGINEERS, ON OPERATIONS IN THE THIRD DISTRICT.

MISSISSIPPI RIVER COMMISSION,
THIRD DISTRICT,
Vicksburg, Miss., May 31, 1911.

COLONEL: I have the honor to submit the following report of operations in the third district, Mississippi River improvement, for the year ending May 31, 1911:

This district was in charge of Capt. Clarke S. Smith, Corps of Engineers, from the beginning of the year to March 24, 1911, on which date it was transferred to me.

The third district on the east side of the Mississippi River extends from t Coahoma-Bolivar County line (365 L.) to the latitude of Warrenton, Miss. (6 L.), and on the west side of Mississippi River from Red Fork, Ark., alo the right bank of Arkansas River to its mouth; thence along the right bank the Mississippi River to the latitude of Warrenton. The work on this secti of the river includes bank revetment at Panther Forest, Leland Neck, a Vaucluse, Ark.; Lake Bolivar Front, Ashbrook Neck, Greenville, Longwoo Fitlers Bend, and Albemarle Bend, Miss.; Lake Providence, Louisiana Ben Delta Point, and Reid-Bedford Bend, La.; at Red Fork, Ark., on the Arkans River; and levee construction in the Lower Yazoo (Miss.) and Upper Tens (La. and Ark.) levee districts.

PART I. CHANNEL WORK.

This work has been under the charge of Assistant Engineer Arthur Hid This report is compiled from data furnished by him.

Lake Bolivar Front, Miss. (*417 L.*).—(For description and previous histo see Report Chief of Engineers, 1903, Supplement, p. 220, and current annu report of the Mississippi River Commission.) The total effective length this revetment is 3,550 feet. The work is in good condition, except at t lower end, where an eddy, caused by the recession of the bank, due to cavi in the bend below, is rapidly undermining the lower end of the revetment. I order to prevent further damage an extension of this revetment downstrea will be necessary. No repairs were made to this revetment last season.

Ashbrook Neck, Miss. (*446 L.*).—(For description and previous history s Report Chief of Engineers, 1903, Supplement, p. 220, and current annual rep of the Mississippi River Commission.) The total effective length of th revetment is 10,275 feet. The old work appears to be in good condition. I may be desirable the present season, in order to complete the reenforceme of the old woven mats, to build a fascine mat between stations 4 and 15. A extension of this revetment about 2,000 feet downstream should be made, caving continues along the upper side of the neck, gradually decreasing i width. At the narrowest point below the revetment the distance betwe bank lines is now less than 2,500 feet. No repairs were made to this revetme last season.

Panther Forest, Ark. (*452 R.*).—(For description see current annual repo of the Mississippi River Commission, and map No. 2,[1] herewith.) The effecti length of this revetment is 4,150 feet. The work of the past season consist of a downstream extension of about 2,000 feet, between stations 28 and 4 Two mats were constructed, 1,131 by 253 and 946 by 253 feet, and four sho mats containing 264 squares, to connect the main mattress with the upper ban paving. The bank was cleared of heavy timber for a distance of 2,300 fee the clearing extending about 1,000 feet below the end of the revetment. Wor was begun August 23 and completed November 12, 1910. Except at the upp end, where some caving occurred, the work is holding well. Caving is st active for some distance above. It will probably be necessary to extend th revetment upstream within the next two years to render the protection of t angle of the controlling levee complete.

The cost of the work was $67,893.12. (For details of work done, cost, et see statement No. 1, herewith.)

Leland Neck, Ark. (*471 R.*).—(For description see current annual report the Mississippi River Commission, and map No. 3, herewith.) The effecti length of this revetment is 4,200 feet. The work done the past season w the construction of a channel mat 1,057 by 250 feet and two shore or connec ing mats containing 652 squares. A number of small defects in the upp bank slope of the old revetment, due to the subsidence of the channel mat were repaired.

An extension of this revetment downstream next season is deemed desirab

The addition of 1,000 feet to the length of the present revetment it believed will afford adequate protection to the spur levee built to preve flow across the neck at flood stages.

This levee is now less than 900 feet from the river bank at its nearest poi where the bank is unprotected.

Six barges were chartered for the use of this party, and about one-half the force was housed in tents. Work was begun October 19 and finish December 19, 1910.

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[1] Not printed.

The cost of this work, including repairs and $5,088.80 for hire of barges, was $51,680.89. (For details of work done, cost, etc., see statement No. 2, herewith.)

Greenville Harbor, Miss. (*478 L.*)—(For description and previous history see Report Chief of Engineers, 1903, Supplement, p. 221, current annual report of the Mississippi River Commission, and map No. 4,[1] herewith.) The effective length of this revetment is 12,500 foot. The revetment is in good condition. In the bend above caving has been active, and now threatens the upper end of the work. It will be necessary to protect the head of the work against further caving. This can best be done by an extension of the revetment upstream; in any event some protection work will be necessary the coming season at this point.

Only minor repairs were made the past season, consisting of replacing stone where the slope had become steep due to rain wash, the building of a small connecting mat of 206 squares between stations 78 and 80, and cleaning out and opening drainage ditches.

Work was begun January 18 and completed January 23, 1911.

The cost of repairs was $4,656.48. (For details, etc., see statement No. 3, herewith.)

Vaucluse, Ark. (*487 R.*).—(For description see current annual report of the Mississippi River Commission, and map No. 5,[1] herewth.) The total effective length of this revetment is 2,700 feet. The work done the last season consisted of an extension of 1,000 feet at the lower end of the revetment, between stations 22+80 and 33, by building a channel mat 1,013 by 253 feet. On account of a rapid rise in the river it was necessary to build five shore mats, containing 966 squares, to connect with the bank paving. It is probable that a further extension upstream will be necessary before the protection to the levee crossing Lake Chicot may be considered complete.

Work was commenced November 14, 1910, and completed January 11, 1911.

The cost of this work was $41,424.25. (For details of cost, work done, etc., see statement No. 4, herewith.)

Longwood, Miss. (*500 L.*).—(For description and previous history see Report Chief of Engineers, 1903, Supplement, p. 198, and current annual report of the Mississippi River Commission.) The effective length of this revetment is 4,200 feet. Existing conditions here are similar to those prevailing for several years past. The revetment is entirely shielded by the sand bar in front and is secure from attack. No further extension is necessary, and no work was done.

Louisiana Bend, La. (*522 R.*).—(For description and previous history see Report Chief of Engineers, 1903, Supplement, p. 221, and current annual report of the Mississippi River Commission.) The effective length of this revetment is 11,300 feet. Conditions have not changed materially during the past season; no further work or extensions seem to be needed, and no work was done.

Lake Providence, La. (*540 R.*).—For description and previous history see Report Chief of Engineers, 1903, Supplement, p. 222, and current annual report of the Mississippi River Commission.) The effective length of this revetment is 12,600 feet. The work remains in good condition. No repairs were needed, and no work was done.

Fitlers Bend, Miss. (*550 L.*).—(For description see current annual report of the Mississippi River Commission, and map No. 6,[1] herewith.) The effective length of this revetment is 3,200 feet. Immediately below the lower end of the work built in 1907 caving had been active. An eddy formed by the jutting out of the hard point below had undermined and destroyed about 600 feet of the upper bank slope since the revetment had been built. The eddy is still active and will continue until the hard point below has caved off.

The work done was the construction of two mats, 263 by 100 feet and 158 by 263 feet, connecting the channel mat with the shore, and grading and paving the upper bank. After these repairs were made caving took place about 2,000 feet above the upper end of the present revetment.

From present indications it would seem desirable to extend this revetment upstream and await further caving below before adding to the length of the work at the lower end.

The cost of these repairs was $9,572.14. (For details of cost, work done, etc., see statement No. 5, herewith.)

Albemarle Bend, Miss. (*568 L.*).—(For description see current annual report of the Mississippi River Commission, and map No. 7, herewith.) The effective length of this revetment by base-line measurement from stations 18+50 to 135 is 11,650 feet. Of this, 1,545 feet was built by a party from the fourth district of the standard form of revetment in use in that district.

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[1] Not printed.

On account of lack of sufficient plant a quarter boat, steamboat, and mattress outfit, with the necessary revetment foremen under the direction of a junior engineer, were obtained from the first and second districts, and six material barges were chartered. The greater part of the force was housed in tents. Later in the season the use of a quarter boat belonging to the fourth district was obtained.

The revetment was located so as to cover the zone where caving had been most active for several years past. This zone was divided into three parts, the first party beginning about 2,000 feet above the lower end of the proposed revetment, the second party 4,000 feet above this, and the fourth district party at the lower end, all three parties working upstream. When it became evident that the work contemplated could not be finished by the three parties at work a fourth party was transferred to the head of the work in order to complete construction in advance of the rapidly rising river at the latter end of the season.

As mat building progressed upstream from the lower end and middle of the zone to be covered the caving of the unprotected bank increased rapidly above the mats, due to the rapid reef formation on the upper side of the bar opposite, forcing the main current of the river at low stage directly against the unprotected bank at the upper part of the bend. Since the work has been finished these conditions have changed materially, and the main force of the current now strikes the bank along the lower third of the completed revetment.

The grading was unusually heavy, due to the old levee near the edge of the bank, which had to be cut in several places for the mat cables to pass through. It was necessary to wash a large portion of this levee into the river and then regrade the bank, fully one-half of the bank having to be graded a second time for this reason.

The first party began work August 17, the second September 6, and the third December 20, 1910. The fourth party (see above) was transferred to the work February 7, 1911. Work was finished March 3, 1911.

The work done by the different parties was as follows:

Parties.	Channel mat.		Connecting mat.	Paving.
	Linear feet.	*Squares.*	*Squares.*	*Squares.*
No. 1	[1] 4,930	13,064	2,000	3,150
No. 2	3,883	9,708	1,781	2,100
No. 3	1,760	4,400	1,179	218
Total	10,573	27,172	4,960	5,468

[1] Of the second mat built by party No. 1, 563 feet was broken in sinking and was replaced by another mat, making the length of bank protected 10,010 linear feet.

The cost of this work was $414,348.82. (For details of cost, work done, etc., see statement No. 6, herewith.)

Brush and poles for the revetment work were obtained under contract.

Stone was procured from the reserve at Greenville; from contract delivery on the bank at Greenville, loaded on barges at Vicksburg, and delivered at the different revetments on contractors' barges.

The progress of the season's revetment work was retarded by insufficient labor, necessitating the continual transportation of men from a distance to the work. The difficulty of keeping these men, and the great amount of sickness on the work was undoubtedly due to crowding on account of insufficient accommodations afforded by the limited number of quarter boats.

Delta Point, La. (598 R.).—(For description and previous history see Report Chief of Engineers, 1903, Supplement, p. 223, and current annual report of the Mississippi River Commission.) The effective length of this revetment is 5,900 feet. No work was done the past season. The revetment remains apparently in good condition. A small amount of repairs should be made the coming season in the way of replacing stone washed from the slope, repairing rain wash, etc.

There has been considerable caving recently for some distance above the revetment, principally a settling of the bank. Should it be found after a survey has been made that this caving has had the effect of moving the main channel toward the left bank and thereby threatening the stability of the West Pass levee, the necessity would arise for an extension of the revetment upstream.

Reid-Bedford Bend, La. (603 R.).—(For description see current annual report of the Mississippi River Commission, and map No. 8,[1] herewith.) The effective length of this revetment at the beginning of the season was 3,500 feet, to which is to be added 1,880 feet constructed by the fourth district the past season, consisting of an upstream extension between stations 6+20 and 25 of the standard form of revetment used in that district. Repairs were also made to the old work.

Red Fork, Arkansas River.—(For description see current annual report of the Mississippi River Commission, and map No. 1,[1] herewth.) The effective length of this revetment is 1,200 feet, all of which is in fair condition. Minor repairs were made the past season, stations 5 to 6+30 and stations 0+40 to 1+70, and repairs made to the upper bank slope. Work was begun March 1 and completed March 6, 1911.

The cost of this work was $3,674.10. (For details, etc., see statement No. 7, herewith.)

STONE AND PLANT.

Operations under the above heads have been under the charge of Assistant Engineer Arthur Hider, and the following reports are from data furnished by him:

STONE.

Quarrying stone.—Preliminary work was begun January 26, 1910, with a small force of self-subsisting labor setting-up machinery, cleaning the yard of trash, and breaking and banking the stone blasted at the close of the previous season. The main force was regularly organized and active operations begun February 8. An average force of 100 laborers was employed. Operations were conducted along the usual lines of quarrying and loading stone.

Navigation opened February 27, 1910, and the first tow of barges reached the quarry March 4. Loading was begun on the latter date and was suspended on account of low water on April 22. During the season 11,000 tons of stone were shipped and 15,000 tons banked on the yard, filling up the quarry floor. The quarry was stripped to a width of 30 feet throughout its length, and 15,000 tons of stone drilled ready for blasting. Operations were suspended on July 9.

The following is a statement of this work:

Classification.	Cubic yards.	Cost.	Cost per yard.
Stripping	60,000	$8,101.80	$0.1350+
Drilling	35,000	8,968.08	.2562+
Blasting	22,000	2,110.30	.0959+
Breaking	20,000	6,215.05	.3107+
Loading [1]	26,000	7,467.43	.2872+
Total	....	32,862.66	1.0850

[1] Banking included with loading.

	Cubic yards.
Stone piled at quarry	14,882.9
Stone loaded on barges	11,117.1
	26,000.0

Towing stone.—After the completion of the Red Fork revetment work, on February 4, 1910, the towboat *Arthur Hider* was transferred to the work of towing stone. On account of low stage of water in White and Little Red Rivers the boat did not arrive at the quarry with the first tow of empties until March 4. Previous to this date she was engaged in towing the outfit from Red Fork to Greenville and Vicksburg and in towing the empty barges from the latter points up White River as far as Nigger Hill. During the season the boat towed 30 barges—11,117 cubic yards—of stone to Greenville. Nine of these—3,442 cubic yards—were delivered to the towboat *H. St. L. Coppee*, for use at Lock No. 8, Ouachita River, Ark. In addition, the boat made three trips to Vicksburg for repairs and for empty barges. The towing season was unusually short, and the low stage of water in both White and Little Red Rivers, together with lack of barges, restricted the available output more than one-half. The *Hider* continued in service until May 25, 1910, when she left for Keokuk, Iowa, to bring down the barges built for this district at the yards of the Rock Island (Ill.) engineer district and for docking and other repairs.

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[1] Not printed.

The following statement gives the cost of the various items of towing:

Month.	Cubic yards.	Pay roll.	Subsistence.	Material, etc.	Property.	Total.
February		$1,166.95	$302.47	$636.45	$9.80	$2,115.67
March	4,309.6	1,680.75	368.00	1,167.95		3,216.70
April	6,807.5	1,644.39	291.19	821.65	12.90	2,770.13
May		660.81	180.87	210.14		1,051.82
Total	11,117.1	5,152.90	1,142.53	2,836.19	22.70	9,154.32

Cost per cubic yard for—

Pay roll	$0.4635+
Subsistence	.1028−
Material, etc	.2551+
Property	.0020+
Total	.8234+

Unloading stone.—This work was begun March 10, 1910, and continued until May 5, 1910. One foreman and an average of 25 laborers were employed. The price paid for labor was $1.25. The stone was received from the Government quarry and was unloaded on the bank at Greenville.

The following is a statement of the work:

Months.	Amount.	Cost of labor.
March	2,052.2	$462.54
April	2,243.1	498.71
May	751.5	151.42
Total	5,046.8	1,112.67

Summary of cost.

Cost per cubic yard to—

Quarry	$1.0850
Tow	.8234
Unload	.2205
Total	2.1289

Seven barges, containing 2,628.1 cubic yards, were held loaded to save the cost of rehandling the stone.

Loading stone.—The contractor, the Foster-Creighton-Gould Co., began the delivery of stone at the Southern Railway tipple July 25, 1910, and completed delivery January 4, 1911. A total of 25,282.58 tons was delivered at a cost of $1.99 per ton unloaded from cars. Of this stone 20,435.8 tons were loaded; the remainder is still in the storage yard at the Southern Railway tipple.

Active loading at the tipple was begun October 6, and from the reserve a quarter of a mile downstream, November 21, 1910. After November 21 two loading plants were used until all the reserve, 5,046.8 tons, was loaded, December 20. From December 23, 1910, to January 16, 1911, all stone loading was suspended, as the contractors, Oscar F. Barrett and John Riess, furnished all the stone that was required for carrying on revetment work. During this period the services of two foremen and a junior engineer were transferred to repair work on Greenville front revetment, one foreman being retained to care for the plant. Loading stone was resumed with one loading plant January 16, and with both loading plants January 26, 1911. This work was suspended February 3, the bridges torn down, and all material stored on loading barges.

During the time loading was carried on with only one plant, one junior engineer and two foremen were employed for supervision; and while loading with two plants, one junior engineer and four foremen. Laborers were paid $1.25 per day, and teams $3 per day up to December 23, after which they were hired under a new agreement at $2.90 per day. Two carpenters were kept constantly employed calking and repairing barges. The cost of these repairs is included in the cost of labor for loading stone.

Below is given a detailed statement of the work:

Months.	Cubic yards loaded.	Cost of labor.	Teams.	Lumber.	Sundries.	Total cost.	Cost per cubic yard.
1910.							
September	....	$146.46	....	....	$8.75	$155.21	....
October	3,484.2	1,189.15	$309.88	$226.56	....	1,625.59	$0.46⅔
November	7,944.1	1,531.31	768.72	249.04	47.34	2,596.41	.32¾
December	7,297.4	1,403.84	612.41	....	28.00	2,044.25	.28
1911.							
January	5,416.2	1,243.16	480.68	....	24.43	1,748.27	.32¼
February	1,340.7	261.38	118.18	....	4.00	388.56	.28⅞
Total	25,482.6	5,675.30	2,289.87	475.60	112.52	8,553.29	.33½

Estimated net cost of loading stone, exclusive of repairs to plant, and allowing 50 per cent for deterioration of loading outfit, is 29½ cents.

Active operations the present season were begun at the quarry on March 7, 1911, and the time to April 4 was devoted to stripping the top of the quarry, and breaking and banking the stone quarried last season after towing had been suspended.

Owing to the unusually low stage of water during January, February, and March, it was impossible for the towboats to reach the quarry. The steamer *Hider* arrived at the foot of the shoals March 9 with a tow of six barges. These barges were taken to the quarry by hand. The towing stage in Little Red River the present season has existed for only 25 days in April. The first tow of empties reached the quarry March 13, but loading was not begun until April 4 on account of insufficient water. On April 1 there were 25 empty barges just below the mouth of Little Red River awaiting a boating stage to the quarry. The towboat arrived at the quarry with the second tow of empties April 6, 1911.

During April, 24 barges, containing 9,473 cubic yards of stone, were shipped from the quarry, and 2,385 cubic yards loaded on barges ready for shipment, leaving approximately 4,000 cubic yards on the floor of the quarry ready to load at the close of the month. Of the amount shipped, 7,094.7 yards arrived at Greenville, one tow being en route, and 3,164.7 yards of this were unloaded as a reserve at Greenville. Should the towing season continue during May it is expected to obtain at least 20,000 cubic yards of stone for revetment purposes from the quarry this season. Two towboats are at present engaged in towing, one with a daylight, and the other with a day and night crew.

The cost of operating the quarry to May 1, 1911, was $7,700.93.

The following is the amount of reserve stone on hand at close of the revetment work:

	Cubic yards.
Vicksburg, Miss	1,656.79
Greenville, Miss	4,846.78
Red Fork, Ark	325.00
	6,828.57

Valued at $13,578.31.

PLANT.

The plant at present available for revetment work consists of the following:

Towboats	2	Material barges, wood—Continued.	
Survey and inspection boat	1	Second class	8
Tug	1	Third class	7
Hydraulic grader	1	Line barges	3
Mattress boats	6	Barges for loading stone	2
Mooring barges	6	Field office quarter boats	2
Material barges, steel, first class	4	Laborers' quarter boats	9
Material barges, wood:		Skiffs	23
First class	17		

The repair outfit is composed of—

Office quarter boat	1	Steel dry dock	1
Machine shop	1	Calking flats	5
Carpenter shop	1	Gasoline yawls	2

The steel dock, two mooring barges, six material barges, one field office quarter boat, one line barge, and four steel barges have been added to the plant during the year. The wooden barges are built of Oregon fir, creosoted.

Two wooden material barges have been transferred to the Vicksburg district for use on Ouachita River during the year; the wooden dry dock has been beached and burned; and one hydraulic grader will be presented for condemnation.

It is proposed to construct the following additional plant to complete outfit for three revetment parties:

Steel towboat	1	Mat boats	2
Creosoted material barges	6	Steel tug	1
Steel barges	8	Hydraulic grader	1
Wooden quarter boats	5		

And for plant for a fourth revetment party:

Hydraulic grader	1	Steel barges	4
Steel tug	1	Mat boats	2

The cost of care of plant for the year was $11,018.30. The average number of employees engaged in care and repairs of plant for the year was 50. Statement of cost of repairs is herewith. (Statement No. 9.)

PART 2.—SURVEYS.

This work has been under the charge of Assistant Engineer A. M. Todd, and data for this report have been prepared by him.

The season's work contemplated the usual annual hydrographic surveys, covering all existing and projected revetment work and all reaches where important levees or interests were threatened by active caving banks. The annual allotment of $5,000 was made to cover the cost.

The usual annual survey was also made of the Yazoo Diversion Canal and Vicksburg Harbor, using the organization of the third district, but charging the cost of the survey to the allotment for "Yazoo River, at mouth."

The survey party was organized for field work September 12, 1910, with Inspector E. F. McMurtrey chief of party, and work was begun at Reid-Bedford Bend. The steamer *Columbia*, of the Vicksburg engineer district, was used. The revetment and reach surveys were made in order, working upstream, and the reach surveys, where no revetment had been authorized, were made on the way down the river after completing the revetment surveys. The survey of the Yazoo Diversion Canal was made after completion of the Mississippi River surveys. All field work was completed and the party disbanded November 28. The steamer *Columbia* was transferred to the Vicksburg district in commission the same day.

The surveys made were of three general kinds, as follows: Revetment, revetment and reach combined, and extended reach and shore-line surveys.

The first includes laying out and retracing base line, and marking off same into stations of 100 and 200 feet, at which points ranges are set along the full length of the revetment. The ranges are sounded across the width of the revetment and beyond, and at intervals of about 2,000 feet they are sounded across the entire width of the river. The second includes, in addition to the revetment survey as above, a reach survey extending beyond the limits of the revetment. The third includes a shore line located along the full reach surveyed, and at intervals of about 2,000 feet ranges are laid off and sounded the entire width of the river. The existing levee lines are also retraced and other prominent features are located where necessary.

Following is a statement in detail showing work done, costs, etc.:

Locality.	Miles below Cairo.	Extent of survey.	Ranges sounded.		Time consumed.
			Across river.	Revetment.	
Revetment surveys:		*Miles.*			*Days.*
Greenville Harbor	477–479	2.8	9	128	5¼
Lake Providence	540–542	2.34	11	50	2¼
Total		5.14	20	178	7½
Revetment and reach surveys:					
Red Fork Bend	Ark. R	1.9	7	10	¾
Bolivar Front	413–418	3.0	4	21	1½
Ashbrook Neck	445–447	4.2	10	65	3½
Panther Forest	450–453	4.7	6	25	2
Leland Neck	469–471	3.8	5	28	2¼
Vaucluse	485–490	3.1	6	20	1¼
Longwood	500–502	4.1	6	28	1½
Louisiana Bend	512–514	2.1	3	21	1¼
Fitters Bend	550–553	3.7	7	26	1½
Albemarle Bend	566–571	8.7	13	61	5
Delta Point	597–599	2.5	16	40	2¾
Reid-Bedford Bend	603–607	6.8	12	36	5
Total		48.6	97	381	29¼
Reach and shore-line surveys:					
Matthews Bend	506–510	4.0	7		1¼
Stack Island Chute	539	3.5	13		1¼
Total		7.5	20		2½
Yazoo Diversion Canal survey			56		5

Statement of field cost.

Pay rolls	$2,635.17
Subsistence	449.28
Coal	651.38
Miscellaneous supplies	183.71
Total	3,919.54

Distribution of time.

	Number.	Per cent.
Days party actually worked	45.0	60
Days lost on account of Sundays, holidays, and rain	16.9	22
Days lost moving, sounding crossings, etc	15.1	18
	77.0	100

	1910–11	1909–10
Total cost per day of party in field	$50.90	$47.04
Cost per mile of revetment surveys	131.30	124.00
Cost per mile of revetment and reach surveys	49.30	50.30
Cost per mile of reach and shore-line surveys	29.10	25.50

It will be noted that the unit costs of the survey were slightly in excess of last season. This is due to the smaller percentage of actual working time. The additional time lost was on account of fog, steamer aground, and sounding crossings en route at all places where 14 feet or less was found. All shoal crossings were sounded on at least three routes in order to ascertain the best channel.

Practically all the notes were reduced while the party was out, and field sheets and comparative sections platted and sent to the office soon after completion of field work at each locality.

Comparison with previous surveys and discussion of results are made as follows:

Red Fork Bend revetment and reach, Arkansas River.—(See map No. 1.)[1] A portion of the old revetment just above the new work has been exposed to the action of the current, with indications of a breach just at the junction of the old and new works. All the new revetment is apparently in good condition except at Range No. 8, where a slight defect is noted and which caused a slip in the upper bank paving. Caving below the revetment continued at a slightly reduced rate. The position of the zero contour of the bar did not change materially.

Lake Bolivar revetment and reach (413–418 L.).—Caving ceased entirely along the front of Island 76 above the revetment. Just above the effective work a slight flanking action is indicated. The work is in good condition, except at the extreme lower end, where it is not effective for about 200 feet, on account of continued flanking action. Below the revetment caving has continued at an average rate of about 60 feet per anum. The position of the zero contour of the bar did not change materially.

Ashbrook Neck revetment (445–447 L.).—Above the revetment the shore line continues to cave slightly. The entire length of the work is apparently in good condition, except at ranges 105–101, and lower ranges 8–10. Continued flanking action is shown at the lower end. The shore line below the revetment did not change materially since the survey of November, 1909, and there has been no material change in the position of the zero contour of the bar.

Panther Forest revetment and reach (450–452 R.).—(See map No. 2.)[1] Above the revetment caving continued at an average rate of about 80 feet per annum. The head of the work shows result of slight flanking action. The work on the whole is shown to be in good condition, although subject to the full force of the current. The lower 200 feet was practically destroyed on account of excessive flanking action. Below the revetment caving continued rapidly. The position of the zero contour of the bar is practically the same as shown last year.

Leland Neck revetment and reach (469–471 R.).—(See map No. 3.) Caving was nominal above the revetment. The full length of the work appears to be in excellent condition, and caving within the limits of the work is effectively checked. A slight flanking action is shown at the lower end. Caving below the revetment continued at an average rate of about 80 feet per annum. The position of the zero contour of the bar remained unchanged.

Greenville Harbor revetment (477–479 L.).—(See map No. 4.)[1] Above the revetment caving continued about as heretofore. The full length of the work is shown to be in good condition, except slight evidence of failure noted at ranges 118, 141, and at lower range 36. The extreme lower end of the revetment, ranges 86–94, shows a heavy fill from top of bank to low water, amounting to as much as 40 feet in places.

Vaucluse revetment and reach (485–490 R.).—(See map No. 5.)[1]—The revetment is shown to be in good condition, although subject to the full action of the current. There is active flanking at both the upper and lower ends. Caving continues above the revetment for one-half mile at an average rate of about 80 feet per annum, and below the revetment to reach range 5 at a rate of about 100 feet per annum. Below this latter point the bank line has not changed during the period. The zero contour of the bar advanced slightly above the revetment but retreated along the revetment and below it.

Longwood revetment and reach (500–502 L.).—Conditions along the revetment have not changed during the period. The fill has progressed at a slightly diminished rate along the work and for about one-half mile below. The deep-water channel remains in about the same position as last year. The rapid caving commencing about half a mile below the revetment continues at a uniform rate of about 150 feet per annum. The position and shape of the bar opposite the revetment remains unchanged.

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[1] Not printed.

Louisiana Bend revetment (*522–524 R.*).—Conditions above and below this revetment remain about the same as shown by the past several surveys. Above range 88 the work is covered by the Ashton bar. About 4,000 feet of the revetment appears to be in good condition and is serving to keep the bank from caving. The zero contour of the bar indicates that a channel is being scoured on the Mississippi side, and if this is continued the point of attack will be shifted to entirely below the revetment.

Lake Providence revetment (*540–542 R.*).—(The bar formation along the upper part of the revetment continued to make downstream at a much reduced rate than was noted last year. The advance shown was from ranges 98 to 92, amounting to 600 feet. The bar extends all the way to range 44, and at a zero stage would be entirely uncovered. The soundings indicate the portion of the revetment still subject to the action of the current to be in good condition, with very slight changes from last year. The position of the deep water opposite the upper end of the revetment did not change materially. The zero contour of the bar opposite the lower end of the revetment retreated during the period.

Fitlers Bend revetment and reach (*550–553 L.*).—(See map No. 6.)[1] The survey shows the work to be in good condition, excepting at range 18, where a defect appears below the low-water level, which might involve the mattress. Flanking action is noted at the lower end of the revetment. Caving continues above and below the work at a somewhat reduced rate. The position of the zero contour line has not changed materially.

Albemarle Bend revetment and reach (*597–570 L.*).—(See map No. 7.) This is a new revetment project, and work was just beginning at time of survey. A base line 14,000 feet long was laid out, marking the position of the proposed revetment. Channel ranges were sounded 200 feet apart along the base line; the usual reach ranges were sounded; and shore lines run for about 1 mile above and 3 miles below the proposed revetment. A shore line had been run in March, 1910, covering the reach as surveyed. Comparing the positions of the two shore lines, very active caving is shown in progress along the upper third of the bend, amounting to an average of 400 feet for the period. The position of the zero contour of the bar and the shape of the sections indicate that continued rapid caving might be expected along the entire reach where revetment is not placed.

Delta Point revetment and reach (*597–599 R.*).—Above the effective revetment the shore line did not change materially during the year; the sections, however, show a general inshore scour and indications that active caving may be expected. The soundings over the effective revetment show it to be in good condition throughout. The position of the zero contour of the bar advanced about 150 feet along the revetment. The river along the West Pass levee and along the Kleinston front is in about the same shape as last year.

Reid-Bedford revetment and reach (*603–607 R.*).—(See map No. 8.)[1] The survey shows the revetment generally in good condition. The heavy deposit of last year over the upper bank paving sloughed down and faulted in places. The salient at ranges 50–52 shows considerable underwater scour, and surface indications seem to point to a failure of the revetment. Serious flanking is taking place at the extreme lower end and failure might be looked for at ranges 56–58. Caving above the revetment has continued at about the same rate as before. Below the revetment the point at range 52 seems to deflect the current to the extent that protection is afforded the river bank for about a mile below the revetment. No caving is noted for that distance. The position of the zero contour has not changed materially.

Matthews Bend reach (*506–510 R.*).—Active caving conditions obtain along the entire reach. Caving was nominal along the upper quarter. Between reach ranges 1 and 3 very active caving is noted following an advance of over 1,000 feet in the zero contour of the bar line. Below range 3 to the lower limit of the survey, caving started again with increased activity, which, if continued, will breach the controlling levee at the Grand Lake crossing within about three years.

Stack Island Chute (*538–542 L.*).—The head of Stack Island continues to cave. Sections 1 to 6 have generally widened and deepened, excepting the narrow chute between the towhead and the main shore, which is rapidly filling up. At ranges 7 to 11 the sections continue to widen by caving of the Mississippi main shore, which, if continued for two more years, will breach the controlling levee line. The sections at the lower outlet of the chute remain practically unchanged, with slightly increased depths. The net result of the survey shows a still further increase in the volume of water flowing through the chute.

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[1] Not printed.

Office drafting and mapping.—In addition to the field work, finished tracings have been made of all the surveys, sections platted on new sheets where necessary, and all the drawings for the annual report have been made. At least one draftsman has been kept busy in the above work practically continuously.

Summary of total expenditures.

	Amount.	Per cent.
Field cost of survey	$3,919.54	75
Drafting, office expenses, etc	1,304.58	25
Total	5,224.12	100

PART 3.—LEVEES.

Work in the lower Yazoo and the upper Tensas levee districts has been under the charge of Messrs. E. C. Tollinger and A. M. Todd, assistant engineers, and this report is compiled from data furnished by them.

Lower Yazoo levee district (*365–599 L.*).—(For detailed history see Report Chief of Engineers, 1905, Supplement, p. 201, and reports of the Mississippi River Commission since 1882.)

The district is located in the State of Mississippi, and extends from the Coahoma-Bolivar County line (365 L.) to the mouth of the Yazoo Diversion Canal at Vicksburg (599 L.). The levee is constructed downstream to a point on Eagle Lake (580 L.). When completed to the lower end of the district the length of the controlling levee line and the area of land protected in this delta will be about as follows:

Local levee district.	Length of levee.	Area protected.
	Miles.	*Square miles.*
Upper Yazoo	124	2,2
Lower Yazoo	189	2,2
Warren County	19	18
Total	332	6,6

A levee 8,800 feet long at the lower end of the district was constructed as part of the Yazoo Diversion Canal improvement.

The following table shows the length of levee constructed during the year, and the length and yardage of the parts abandoned by the new loops:

Locality.	Miles below Cairo.	Station number of loops.			Length of—		Cubic yards abandoned.
		New loop.		Old loop.	New loop.	Old loop.	
		Beginning.	End.				
Riverton	400	1575	1664+29	1664+93	8,929	[1] 8,966	300,00
Shiloh	555	4233	4321+10	4303+50	8,810	[2] 9,325	325,00
Albemarle Bend	568	4733	4881+73	4864	14,873	[3] 13,235	475,00
Total					32,612	31,526	1,200,00

[1] Break in notation of this loop, 1644+73=1645.

[2] Breaks in notation of this old loop, 4281+45=4268+70; 4278=4290.

[3] Break in notation of this old levee, 4821+70=4820+85.

This gives a net increase of 1,086 feet, or 0.21 mile, making the length of the controlling levee 188.6 miles.

The following is a statement of the yardage in cubic yards:

Contents of levee May 1, 1910		43, 720, 939
Added during the year by the United States	906, 495	
Added during the year by the levee board	1, 275, 833	
Total added during the year	2, 182, 328	
Abandoned during the year	1, 200, 000	
Net increase		982, 328
Contents May 1, 1911		44, 703, 267

Since 1882 the United States has constructed 24,062,589 cubic yards, and of the total yardage in the controlling levee line, about 42.4 per cent has been placed by the United States and about 57.6 per cent by the levee board.

Repair work, being generally a replacement of work previously lost, is not included in the yardage added during the year. Yardage of drain ditches is also omitted.

The following is a list of the unfinished contracts in force May 1, 1910, enlargement work, under contract with Shields Bros. & Nystrom, all of which have since been completed:

Stations.	Miles below Cairo.	Date of contract.
960 to 1000	381	Nov. 30, 1908
1328 to 1500	397	July 17, 1909
2400 to 2550	416	Do.

In 1910 the commission allotted $160,000 for the lower Yazoo levees, and contracts were let from this allotment as follows:

[Clark, Bobbitt & Co., for new work, to be completed Jan. 1, 1911.]

Stations.	Miles below Cairo.	Cubic yards in contract.	Price per cubic yard.	Remarks.
			Cents.	
4738 to 4760	568	110,000	18.50	1 contract.
4760 to 4777	568	110,000	18.00	
4777 to 4795	568	110,000	18.00	
4795 to 4812	568	110,000	19.00	Do.
4812 to 4838	569	110,000	16.75	
4838 to 4862	569	110,000	19.90	Do.
4862 to 4884+74	569	110,000	19.90	
Total		770,000	[1] 18.58	

[Helgason Bros., for enlargement, to be completed Jan. 1, 1912.]

1717 to 1810	400	93,000	14.40	
1810 to 1900	400	90,000	14.40	
Total		183,000	14.40	

[1] Average.

Contracts with Clark, Bobbitt & Co. were dated August 6, 1910, and those with Helgason Bros., November 14, 1910.

An agreement was made with R. T. Clark for about 5,000 cubic yards of excavation (ditching) at Albemarle (569 L.) at 30 cents per cubic yard, the work to be completed on or before March 10, 1911.

The following is a statement of progress:

	Cubic yards in contract.	Placed this year.		Placed to date.	
		Cubic yards.	Per cent.	Cubic yards.	Per cent.
Previously unfinished enlargement	453,587	192,085	42	453,587	100
1910–11:					
New levee	677,317	677,317	100	677,317	100
Ditch	4,765	4,765	100	4,765	100
Enlargement	178,000	32,644	18	32,644	18
Total	1,313,669	906,761	69	1,168,313	89

Details of work done during the year will be found in statement No. 10, which accompanies this report.

REPAIRS AND MAINTENANCE.

The only repairs that have been made in this district by the United States this year consisted of resodding parts of previously accepted levees, as follows:

Stations.	Miles below Cairo.	Length resodded.	Cost.
		Feet.	
1328 to 1500	397	6,400	$64.00
2400 to 2550	416	4,200	52.50
4812 to 4838	569	1,500	16.25
4838 to 4862	569	2,400	54.00
Total		14,500	186.75

All other repairs were made by the levee board.

SURVEYS.

Damages to lands, crops, and improvements, from the increased height of floods causd by levee building, claimed in suits in the Court of Claims, have been investigated.

Additional location surveys were made for the Albemarle Bend levee (568 L.) before beginning its construction. Surveys for the enlargement of stations 1717–1900 (400 L.) and 1900–2200 (401 L.), and a location survey for the proposed new loop at Warfield Point (483 L.) have been made.

The following shore lines have been traced: Dennis Landing (450–500, L. 372), Waxhaw (1040–1220, L. 392), Riverton (1543–1646, L. 400), Bolivar and Buck Ridge (2560–2740, L. 418), Choctaw Bend (3250–3300, L. 435), Warfield Point (210–330, L. 483, a second line at this point having been run on account of active caving), Princeton Landing (2050–2100, L. 514), Baleshed (3130–3250, L. 536), Ben Lomond (3320–3410, L. 542), Promised Land (3550–3620, L. 546), and Shiloh (4200–4300, L. 560).

BANK LINES.

Parker to Dennis (*367–373 L.*).—The old levee in front of the Australia loop was breached in 1907–8. Caving continues, and opposite mile 372 has averaged 160 feet per year between 1904 and 1911.

Waxhaw (*392–394 L.*).—Caving has increased along this front and has averaged 300 feet per year between 1907 and 1911.

Terrene (*395 L.*).—The change along this front has been very slight.

Riverton (*400 L.*).—The caving has moved farther down the bend and amounted to 150 feet for the year ending May 1, 1911.

Bolivar (*417 L.*).—No change in bank lines.

Choctaw Bend (*435 L.*).—The river is very close to the levee at one point in the bend, but there has been practically no caving during the year.

Ashbrook Neck (*445–448 L.*).—Reference to work here has already been made.

Tarpley Neck (*460–465 L.*).—This neck is 4,000 feet wide at the narrowest point. It has no revetment. Erosion on the upper side is slight; none on the lower side.

Bachelors Bend (*474–479 L.*).—Bank lines remain practically unchanged.

Longwood Front (*499–505 L.*).—Caving continues from a short distance below the mattress work to the lower end of the bend. The maximum caving is opposite mile 501½, where the rate has been 217 feet per year between 1905 and 1911.

Valewood Front (*528 L.*).—There has been very little caving on this front during the last four years, and only a slight increase during the past year. The abandoned levee was breached in 1908–9.

Stack Island (*538–542 L.*).—Conditions at the upper end of the chute have improved by accretions to the shore and the cutting away of the head of Stack Island. Caving continues on both sides further down the chute, being most active opposite range 9, where it has caved 200 feet this year. A short loop may be required in 1911–12.

Promised Land (*546–550 L.*).—The caving has moved downstream, and is most active opposite mile 548, where it has amounted to 1,200 feet this year. The sand bar above this point is making downstream, and the indications are that it will afford protection to the controlling levee, which was threatened in 1909–10.

Fitlers (*552 L.*).—Caving has been quite active above and below the revetment during January to March, 1911. It may be necessary to extend the revetment both up and down stream for the protection of the work now in place.

Shiloh or Cottonwood (*553–560 L.*).—Caving is less active than a year ago. Conditions have improved at the head of the chute by the caving on the river side lessening the flow through the chute.

Albemarle Bend (*567–572 L.*).—Caving in this bend averaged 500 feet per year from 1882 to 1906 and 400 feet from 1906 to 1910, increasing to a rate of 1,000 feet per year for the months of October and November, 1910. Reference to revetment work here during the past season has already been made.

CONDITION OF LEVEES AND ESTIMATES FOR FUTURE CONSTRUCTION.

The entire levee is 1.5 feet or more above the highest known water. Compared with the grade and section recommended by the Mississippi River Commission, there is—

	Miles.	Per cent.	Above 1903 high water.
			Feet.
Of sufficient height and section	28.9	15.3	4.0
Of sufficient height but insufficient section	43.1	22.9	4.0
Of sufficient section but insufficient height	6.5	3.4	3.0
Of insufficient section and height	110.1	58.4	1.5 2.0
Total	188.6	100.0	....

The levee reenforced by banquette is as follows: 65.7 miles with grade 4 feet below the highest water level, 66.2 miles with grade 6 feet below the highest water, 9.9 miles with grade 8 feet below, 10.8 miles with grade 12 feet below the highest water, and 36 miles without banquette.

The following is an approximate estimate of yardage required for completion of the levee to the commission grade:

Item.	Above Greenville.	Below Greenville.	Total.
	Cubic yds.	*Cubic yds.*	*Cubic yds.*
Enlargement	1,910,200	3,921,600	5,831,800
Banquette	356,200	1,225,000	1,581,200
Increase of slope from 1 on 3 to 1 on 4	....	....	1,300,000
New loops required in next two years	....	....	900,000
Total	....	....	9,613,000

LEVEE BOARD WORK.

The following is a summary of the contracts let by the levee board during the year:

Date of letting.	Kind of work.	Cubic yards.	Average price.
			Cents.
September, 1910	Spur	25,000	18.75
February, 1911	Enlargement	672,000	27.47
Total for year		697,000	27.16

Details of work by the levee board during the year are given in statement No. 12, appended to this report.

REPAIRS.

The repair work done by the levee board was by day force. The details of location and kind of work done are given in statement No. 12, already referred to.

CARE AND PRESERVATION OF THE LEVEE.

The levee board has given very close attention to the care and preservation of the levees, in keeping travel off them and in clearing the right of way of all obstructions. This work, in the main, is done by six mounted patrolmen—three above and three below Greenville. Their instructions require them to ride over the entire line every day.

The following is an analysis of the expenditures of the levee board, exclusive of inspection, engineering, and administration:

	Amount.	Per cent.
Construction	$272,322.84	83.7
Repairs	17,172.36	5.3
Right of way	35,346.93	10.9
High-water protection	482.80	.1
Total	325,324.93	100.0

The following is an analysis of the expenditures of the United States during the year:

	Amount.	Per cent.
Construction	$184,513.12	95.9
Repairs	260.08	.1
Surveys	1,856.42	1.0
Engineering	5,872.16	3.0
Total field expenses	192,501.78	100.0
Engineer office charges	2,001.39	
Total expenditures	194,503.17	

WARREN COUNTY LEVEE DISTRICT.

The board of levee commissioners for the Warren County levee district had no right to levy taxes or to collect revenues until the legislature of Mississippi passed a law in March, 1910, giving it the same rights that had been conferred or other levee boards. No revenues have yet been collected by this board.

The principal object in forming this board was to extend the levee system from Eagle Lake (573 L.) to Vicksburg (599 L.)

(*Upper Texas levee district* (*402–606 R.*)—(For detailed history see Report Chief of Engineers, 1905, Supplement, p. 203, and reports of the Mississippi River Commission since 1882.)

Extent of the district.—The levees included in this district consist of two separate lines, as follows: (1) An extension of the Arkansas River levee, right bank, below Red Fork, Ark., 18.1 miles, and (2) the Mississippi River levee, which begins on comparatively high ground on the north bank of Amos Bayou and extends in a southeasterly direction to the bank of the river about one-half mile below the mouth of Cypress Creek (426 R.); thence along the right bank to the lower limit of the third district (606 R). Between the two lines of levee there remains a gap of 2.9 miles, which has been left on account of the impracticability of closing Cypress Creek, which drains an area of 392 square miles. The length of the Mississippi River levee is 171.9 miles, of which 81.9 miles are in Arkansas and 90 miles in Louisiana. The total length of levee line in the district is 190 miles, protecting completely about 2,500 square miles, and in addition 500 square miles from ordinary floods.

The following table shows extensions and new levees completed, covering levees abandoned on account of caving banks:

Locality.	Miles below Cairo.	Beginning station number.	Length of— New levee.	Length of— Old levee.	Abandoned.
			Feet.	*Feet.*	*Cubic yds.*
Arkansas River extension	Ark. R.	916	3,700		
Atherton, La.	558 R.	2,227	2,593	2,944	40,000
Total			6,293	2,944	40,000

The net change in length amounts to an increase of 3,349 feet, or 0.63 mile.

LEVEE CONSTRUCTION BY THE UNITED STATES.

At the beginning of the period the following uncompleted contracts were in force:

Stations.	Miles below Cairo.	Kind of work.	In place May 1, 1910.	To place May 1, 1910.	Contractors.
			Cu. yds.	*Cu. yds.*	
871 to 916	Ark. R.	New levee		90,000	W. T. & E. M. Lowrance.
360 to 390	427	Enlargement	29,253	16,747	Roach & Stansell.
1240 to 1360	442	do	64,671	13,329	Shields Bros. & Nystrom.
1940 to 2050	467	do	19,909	82,091	Clark & Parker.
Total			113,833	202,167	

The Mississippi River Commission allotted $120,000 to this district for the fiscal year ending June 30, 1911, for the expenditure of which proposals were opened July 21, 1910, and contracts awarded for the following work:

Stations.	Miles below Cairo.	Kind of work.	Estimated contents.	Contract price.	Contractors.
			Cu. yds.	*Cents.*	
920 to 942	Ark. R.	New levee	100,000	35.00	W. T. & E. M. Lowrance & Co.
942 to 957	Ark. R.	do	70,000	35.00	Do.
1865 to 1985	548	Enlargement	110,000	25.95	Helgason Bros.
2805 to 2860	576	do	50,000	15.70	H. F. Garbish.
3070 to 3160	579	do	90,000	19.35	Donaven & Daley.
Total			420,000		

The average cost of the above work at the prices bid amounts to 26.9 cents per cubic yard.

At the beginning of the period the river was just subsiding to a stage that would allow resumption of work on the enlargement contracts. All the contractors commenced work within a reasonable period after the contracts were awarded and the work generally was prosecuted at a satisfactory rate. The working season was exceptionally good; labor was a little scarce at times, but the work was not delayed materially on this account.

The following statement shows date of commencement or resumption of work and date of completion on all contracts:

Stations.	Miles below Cairo.	Date work was commenced or resumed.	Date of completion.
871 to 916	Ark. R.	Aug. 14, 1910	Mar. 3, 1911.
920 to 942			
942 to 957			
360 to 390	427	Sept. 16, 1910	Nov. 19, 1910.
1240 to 1360	442	Aug. 1, 1910	Nov. 4, 1910.
1940 to 2050	467	May 12, 1910	Jan. 9, 1911.
1865 to 1985	548	Sept. 1, 1910	Not completed.
2805 to 2860	576	Dec. 28, 1910	Mar. 29, 1911.
3070 to 3160	579	Oct. 1, 1910	Mar. 8, 1911.

From the above it will be noted that all work under contract was completed except one reach of enlargement, of which there remained 10,557 cubic yards to be placed May 1, 1911. A freshet in the river coming just high enough to flood the pits along the uncompleted portion of the contract forced suspension of work February 11, 1911. The stage of the river has not permitted resumption of work to date.

Statement No. 13 appended hereto shows all contracts in force during the period, work done, together with construction details, etc.

LEVEE BOARD CONSTRUCTION.

Good progress was made on all State and levee board work. All the contracts in force at the beginning of the period, and all let early in the season, with but two exceptions, were completed in good time. The sinking levee at Chicot (431 R.), noted in the last annual report, was successfully constructed to gross grade during October and November, 1910, and since completion only minor settlement has been noted. During the period the various levee boards in the district placed 1,148,515 cubic yards, and have contracts in force for about 1,100,000 cubic yards remaining to be placed. Their total expenditure for levee work amounted to $236,080.56, making an average of about 20.56 cents per cubic yard. Statement No. 14, herewith, shows the levee board work in detail.

SUMMARY OF EARTH IN PLACE.

The following table shows the yardage added to the levee line, the amount lost by levees abandoned, and the net amount of yardage in place at the end of the period:

	Arkansas River levees.	Mississippi River levees in—		Totals.
		Arkansas.	Louisiana.	
	Cubic yards.	*Cubic yards.*	*Cubic yards.*	*Cubic yard*
In place May 1, 1910	2,454,397	15,991,229	19,132,112	37,577,73
Added during the year:				
By United States	271,102	128,379	244,273	643,75
By levee boards	32,964	450,753	656,580	1,140,2
Total	2,758,463	16,570,361	20,032,965	39,361,78
Lost by levees abandoned			40,000	40,00
Net contents May 1, 1911	2,758,463	16,570,361	19,992,965	39,321,7

Since 1882 the United States has constructed in this district 27,608,287 cubic yards of levees, and of the total yardage in the controlling line about 55 per cent has been built by the United States and about 45 per cent by the levee boards.

ESTIMATE TO COMMISSION GRADE.

Following is a revised estimate to complete the levees to the grade and section as adopted by the commission in 1898. This estimate is corrected each year by deducting net yardage of all work completed and under contract.

	Enlargement.	Banquette.	New levees and extensions.	Total.
	Cubic yards.	*Cubic yards.*	*Cubic yards.*	*Cubic yards.*
Arkansas River levee	1,150,000	525,000		1,675,000
Do		75,000	400,000	475,000
Levees in Arkansas	1,650,000	1,804,000	300,000	3,754,000
Levees in Louisiana	1,450,000	2,041,000	500,000	3,991,000
Total	4,250,000	4,445,000	1,200,000	9,895,000

The estimated yardage required to complete the levees to commission grade, including work under contract but not completed and exclusive of probable new levees, amounts approximately to 8,700,000 cubic yards.

REPAIRS AND MAINTENANCE.

The only repair work undertaken was the restoration and resodding of the end of the Panther Forest Dike (452 R.), at a total cost of $886.50. Repairs and maintenance generally were left to State authorities and the local levee boards. The levee line in most instances was maintained in good condition, all necessary minor repairs, resodding, and weed cutting having been performed.

LOCAL SURVEYS AND OBSERVATIONS.

The usual local caving-bank observations were made from time to time. During the months of March and April the local inspectors in the field were engaged on new loop, shore line, and level over top of levee surveys. Following is a statement of work done:

Stations.	Miles below Cairo.	Number of miles in survey.	Kind of survey.
0 to 953	Ark. R.	18.1	Levels over top of levee.
0 to 1020	425–438	19.4	Do.
464 to 532	428	1.3	New levee located.
464 to 532	428	2.5	Shore line run.
Total		41.3	

The expenditure chargeable to local surveys was $893.91.

The levels indicated, as usual that the grade line of the levee stood considerably lower in many places than when the previous levels were run, especially where fills of over 18 feet occur, and where old lake beds and sloughs are crossed by the levee line.

Conditions along reaches where active caving banks will threaten the controlling levee line within the next few years are as follows:

Lucca to Chicot (425–432 R.).—Continued caving is noted along the upper portion of this reach. The distance from levee to river bank opposite station 483 was reduced from 450 feet to 360 feet. The Tensas Basin levee board has let a contract for the construction of a new levee covering this point. Caving continues very slowly along the lower portion of the reach. The new levee, stations 620–740, is now completed, and the front line has been abandoned.

Grand Lake, Ark. (*507 R.*).—Conditions indicate that the present levee crossing of Grand Lake will be breached within about three years. A full discussion of the caving at this point is found in report on surveys accompanying

Atherton, La. (*558 R.*).—Observations during the year developed that the caving along this entire reach was renewed with great activity. Opposite station 2148 the river bank caved about 300 feet from March, 1910, to March, 1911, leaving about 750 feet from center of levee to shore line. Caving continued rapidly opposite station 2220. The Fifth Louisiana Levee Board constructed a short protection loop covering this point. The construction of a new levee from about station 2083 to 2264, about 3½ miles, estimated to cost $90,000, is considered urgent.

Mascot, La. (*577 R.*).—The rate of caving increased along the middle of this reach, threatening to breach the levee at station 3008. The Fifth Louisiana Levee Board let contracts in March, 1911, for the construction of a new levee covering stations 2930 to 3076.

Omega to Millikens Bend, La. (*578–582 R.*).—Nominal caving continued along this entire reach. The distance from center of levee to river bank at various points is as follows: Station 3190, 800 feet; 3274, 385 feet; 3290, [illegible] feet; and 3385, 1,000 feet. It is thought that possibly a new levee covering stations 3275 and 3290 will have to be built in the near future. The entire reach of levee along this front is low, with the exception of the new Morancy loop, and it is considered unwise to undertake its improvement on account of the uncertainty of the existing location.

Sparta to Duckport. (*588–590 R.*).—The river bank is very close to the levee line along this front, but there has been very little change since the last report. The caving has moved farther downstream. It is probable that a new levee will be needed near the lower portion of this reach within the next few years.

Delta, La. (*597 R.*).—A deep pocket cave, occurring in November, 1910, threatens to breach the levee at station 4200. This point can be readily covered by a short levee, which may be required during 1911.

CONDITION OF LEVEE LINE AND ESTIMATE FOR CONTINUED CONSTRUCTION.

Following is a statement relative to the general height of the levee line, assuming the completion of all levee work which has been provided for and which is now under contract, and correcting after taking into account the conditions as found by the most recent lines of levels over the top of the levee:

Above 1903 high water.	Arkansas River levees.		Mississippi River levees—				Totals.	
			In Arkansas.		In Louisiana.			
	Miles.	Per cent.	Miles.	Per cent.	Miles.	Per cent.	Miles.	Per cent.
1 to 2 feet	[1] 18.1	100	[2] 7.6	9.3	[2] 11.0	12.2	36.7	[illegible]
2 to 3 feet	......	......	28.2	34.4	8.7	9.9	36.9	[illegible]
3 to 4 feet	......	......	23.9	29.2	40.7	45.2	64.6	[illegible]
4 feet or more	......	......	22.2	27.1	29.6	32.7	51.8	[illegible]
Total	18.1	100	81.9	100.0	90.0	100.0	190.0	[illegible]
Levees with banquette	......	......	26.7	32.5	50.3	55.9	77.0	[illegible]

[1] Ten miles has section 6-foot crown, 3 to 1 back slope and 2.5 to 1 front slope; 3.2 miles has 6-foot crown 3 to 1 back slope and 2 to 1 front slope. Entire line grade 2 feet above 1903 high water.

[2] Several reaches stand to grade averaging 2 feet above 1903 high water.

It will be noted that only about 41 per cent of the total mileage has a banquette section, and most of these reaches have banquettes considerably below the standard grade and section. The reaches where the land slide slopes have been observed to be deficient, especially where the back slopes become saturated and sloughy during high water should be strengthened as soon as possible by the construction of banquettes to commission grade.

Since 1907 all enlargement work has been placed under the following project: To enlarge all reaches of the levee to a provisional grade of not over 4 feet above the 1903 high water, with standard section, and to add a light topping 1.5

feet above gross grade, with 2-foot crown and 2 to 1 slopes. After deducting all work completed and authorized under the above project, the following is an estimate for enlarging the balance of the line to the grade and section stated:

	Cubic yards.
Arkansas River levees	980,000
Levees in Arkansas	1,143,000
Levees in Louisiana	650,000
Total	2,925,000

EXTENSION OF ARKANSAS RIVER LEVEE.

Work performed by the United States and the Red Fork Levee Board extended this line from station 916 to 953, a distance of about three-fourths of a mile. The end of the levee as constructed is in the lowest part of the swamp between the bank of the Arkansas River and the relatively high ground on Red Fork Bayou. A further extension of 1 mile would carry the levee well up on higher ground, gaining about 5 feet in elevation at the base of the levee, and would lower the backwater approximately 0.8 foot for equal gauge heights. A gap of 1.5 miles would still remain between the Arkansas and Mississippi River levees, which would be ample to pass all the water coming out of Cypress Creek, even assuming crevasse and overflow conditions along the Arkansas River levees. The cost of the 1 mile extension is estimated as 250,000 cubic yards, at 25 cents, amounting to $62,500.

DIVERSION OF CYPRESS CREEK.

It is reported that special acts have passed the current Arkansas Legislature, authorizing the organization of drainage districts in Desha and Chicot Counties for the purpose of effecting the proposed diversion of Cypress Creek in accordance with the plan outlined in the report of Capt. Clarke S. Smith, Corps of Engineers, to the Mississippi River Commission, dated March 30, 1908, on the "Practicability of diverting Cypress Creek drainage, etc.;" the ultimate object in view being to finally effect the closure of the gap between the Arkansas and Mississippi River levees.

CARE AND PRESERVATION OF LEVEES BY LOCAL AUTHORITIES.

All of the local authorities are now taking good care of their respective levee lines, except in the lower part of Desha County, Ark. Here hogs have been allowed to do great damage, particularly above Arkansas City; and just below Arkansas City along the Fulton Lake levee great difficulty has been experienced in keeping travel off the levee. The attention of the officials of the Desha Levee board has been repeatedly called to these abuses, and attempts have at times been made by the board to correct the conditions, but with little effect.

Summary of expenditures.

	Amount.	Per cent.
Construction	$168,075.67	94.3
Repairs, etc	886.50	.6
Surveys, observations, etc	893.91	.6
Engineering[1]	7,785.12	4.5
Total field expenditures	177,641.20	100.0
Engineer office charges	2,732.05	....
Total expenditure	180,373.25	....

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[1] Includes supervision of construction of levee-board work for the various levee boards amounting to $128,669.97, which, if added to the above expenditures in the field, would make the cost of engineering 2.5 per cent.

HIGH WATER OF 1911.

At the date of this report there have been two minor freshets, originating in the Ohio River, the first in February, of moderate height, the second just exceeding flood height at Cairo on April 21. The following table shows the heights reached at the principal gauge stations, Cairo to Vicksburg, also a comparison with the highest stage of record at each point:

Stations.	Miles below Cairo.	Flood stage.	Highest, 1911.	Date.	Previous highest stage.		Above 1911.
					Year.	Feet.	
		Feet.	*Feet.*				*Feet.*
Cairo		45	45.4	Apr. 21	1883	52.2	6.
Memphis	230	33	36.5	Apr. 26	1907	40.2	3.
Helena	307	42	44.5	Apr. 28	1897	51.8	7.
Mouth of White River	393	42	48.4	May 1	1903	53.7	5.
Arkansas City	438	42	48.0	May 2	1903	52.9	4.
Greenville	478	36	41.7	May 3	1903	49.1	7.
Lake Providence	542	36	41.5	May 4	1903	46.5	5.
Vicksburg	599	45	45.1	May 6	1897	52.3	7.

The water was at least 8 feet below the top of the levees at the lowest points. No high-water maintenance work was necessary, except at two of the dikes—one in Arkansas and one in Louisiana. At both places the ends were new and a mat of sod had not grown sufficiently to afford protection. This work was done by the levee boards.

The above statement shows that the highest stage at Vicksburg this year was 0.1 foot above flood stage. (For record of duration of flood stage at Vicksburg as far back as obtainable, see Report of the Mississippi River Commission, 1910, p. 3055.)

GAUGE RELATIONS.

(For a comparison of the maximum stages at Lake Providence with those at Arkansas City, Greenville, and Vicksburg, see Report of the Mississippi River Commission, 1910, p. 3057.) A similar comparison for this year indicates a relatively higher flood plane at Lake Providence, or relatively lower ones at Greenville and Vicksburg in recent years.

RELATION OF FLOOD HEIGHTS TO FLOOD STAGES.

(For detailed statement of these relations from 1897 to 1910, inclusive, see Report of the Mississippi River Commission, 1910, p. 3055.) A similar comparison of this year's flood shows that the averages for the years 1897 to 1911, inclusive, are the same as given in the table above referred to.

DRAINAGE.

Drainage districts have been organized in Mississippi that will comprise all the drainable lands in the delta. The seep ditches along the levee, which must form a part of this system, will minimize seepage through the levee. Excavation has not yet been commenced in any part of the Lower Yazoo levee district.

Limits of the high water of 1911, as compared with 1908, in the Lower Yazoo levee district and between the Arkansas and Mississippi River levee systems are shown on map No. 12, herewith.

Appended to this report are 14 statements of details. Maps Nos. 1 to 12,[1] inclusive, accompany.

Money statement, abstract of contracts in force, and apportionment of cost and deterioration of plant will be forwarded July 1, 1911.

Very respectfully,

J. A. WOODRUFF,
Captain, Corps of Engineers.

Col. WM. T. ROSSELL,
Corps of Engineers, United States Army,
Acting President Mississippi River Commission.

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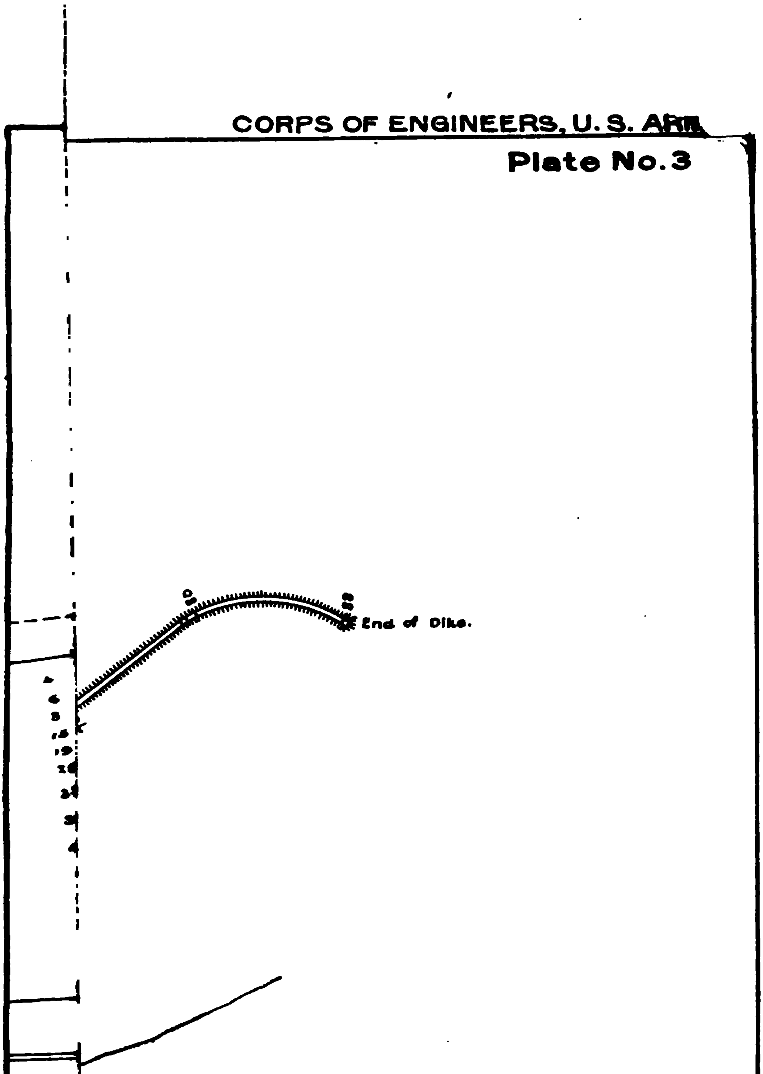
[1] Nos. 3, 7, and 12, only, printed.

CORPS OF ENGINEERS, U. S. ARM

Plate No. 3

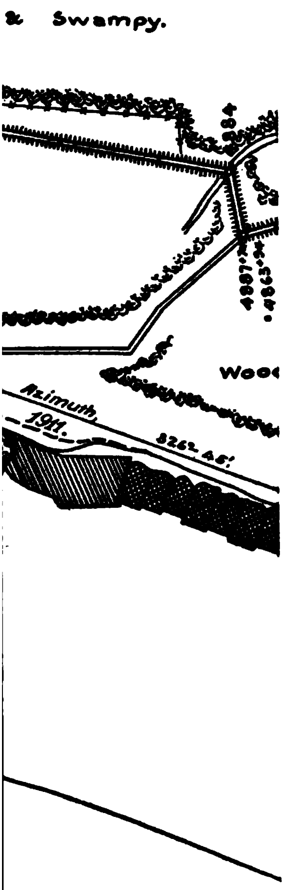


ISSISSIPPI RIVER COMMISSION
THIRD DISTRICT.
LELAND NECK REVETMENT
470-471 M. B. C.

UNDER THE DIRECTION OF
Capt. J. A. Woodruff,
Corps of Engineers, U. S. A.
Arthur Hider, Asst. Engineer.

SCALE OF FEET

Soundings are reduced to Zero of Greenville Gauge.
ompiled from Local Surveys of Nov. 1909, and Oct. 1910.
Traced April, 1911, by



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STATEMENT No. 1.—*Panther Forest, Ark.*

Statement of work done.	Cost.	Per cent.
5,254 squares channel mat, at $6.477	$34,032.86	50.1271
1,960 squares paving bank, at $7.307	14,322.85	21.0962
Property	4,892.59	7.2063
90 days, towing (Coppee), at $48.338	4,350.39	6.4077
264 squares pocket mattress, at $8.103	2,139.34	3.1511
Sundries	2,056.87	3.0295
1,900 linear feet hyrdaulic grading, at $1.002	1,904.86	2.8057
1,900 linear feet grade dressed, at $0.461	876.51	1.291
Supervision	860.82	1.2679
Outfitting	735.84	1.0838
2,300 linear feet bank cleared, at $0.31	711.77	1.0484
Transportation of labor	424.25	.6249
250 linear feet hand grading, at $1.299	324.89	.4785
475 linear feet ditching, at $0.271	128.94	.1899
Repairs to old paving	75.70	.1115
10 squares revetment, at $5.464	54.64	.0805
Total	67,893.12	100.00

STATEMENT No. 2.—*Leland Neck, Ark.*

Statement of work done.	Cost.	Per cent.
2,642 squares channel mat, at $8.4257	$22,260.63	43.073
652 squares pocket mat, at $6.9897	4,557.26	8.818
1,173 squares bank paved, at $6.8063	7,983.77	15.448
309 squares revetment, at $6.4986	2,008.06	3.885
63 days' towing (Coppee and Parker), at $58.31	3,673.77	7.109
1,287 linear feet hydraulic grading, at $1.9254	2,478.10	4.795
1,287 linear feet hand grading, at $0.477	614.05	1.188
Supervision	393.75	.762
Transportation of labor	706.80	1.368
Engineer office charges	727.74	1.408
Hire of barges, etc	5,332.86	10.319
Loading stone	944.10	1.827
Total	51,680.89	100.00

STATEMENT No. 3.—*Greenville Harbor, Miss.*

Statement of work done.	Cost.	Per cent.
206 squares pocket mattress, at $8.24	$1,697.44	36.453
89 squares bank paved, at $7.80	694.20	14.908
181 squares bank repaired, at $7.35	1,329.10	28.543
Sundries	935.74	20.096
Total	4,656.48	100.00

STATEMENT No. 4.—*Vaucluse, Ark.*

Statement of work done.	Cost.	Per cent.
2,563 squares channel mat, at $6 4763	$16,578.73	40.0218
966 squares pocket mat, at $7.8841	7,616.16	18.3858
941 squares paving bank, at $7.3501	6,916.65	16.6971
67 days' towing, at $65.6326	4,397.38	10.6155
1,380 linear feet hydraulic grading, at $1.5808	2,181.61	5.2665
Sundries	1,641.35	3.9623
3,000 linear feet clearing bank, at $0.2797	838.92	2.0252
Supervision	559.83	1.3514
1,380 linear feet grade dressed, at $0.3188	439.95	1.0621
Inspection	234.87	.5669
Property	18.80	.0454
Total	41,424.25	100.00

STATEMENT No. 5.—*Fitlers Bend, Miss.*

Statement of work done.	Cost.	Per cent.
663 squares pocket mattress, at $7.103	$4,709.41	49.2
275 squares bank paved, at $7.032	1,983.92	20.2
400 linear feet grade dressed, at $0.228	91.23	.95
15 days' towing, at $57.923	868.85	9.08
Inspection	89.53	.94
Supervision	116.88	1.22
Sundries	1,762.32	18.41
Total	9,572.14	100.00

STATEMENT No. 6.—*Albemarle Bend, Miss.*

Statement of work done.	Cost.	Per cent.
27,172 squares channel mat, at $7.851	$213,296.35	51.42
4,960 squares connecting mat, at $9.089	45,079.50	10.87
5,468 squares bank paved, at $9.897	54,120.09	13.05
32 squares revetment, at $7.207	230.64	.05
8,550 linear feet slope dressed, at $0.497	4,254.88	1.03
12 acres bank cleared, at $135.47	1,625.68	.39
3,000 linear feet ditching, at $0.068	202.47	.05
11,000 linear feet hydraulic grading, at $1.1190	12,310.97	2.96
200 days' towing, at $173.914	34,782.71	8.39
Outfitting	671.42	.16
Inspection	3,181.70	.77
Supervision	4,737.62	1.14
Property	10,426.01	2.52
Transportation of labor	3,090.81	.74
Rent of barges	7,134.23	1.72
Engineer office charges	1,500.00	.36
Sundries	17,703.74	4.27
Total	414,848.82	100.00

STATEMENT No. 7.—*Red Fork, Arkansas River.*

Statement of work done.	Cost.	Per cent.
171 squares pocket mat, at $8.90	$1,521.90	41.43
20 squares paving, at $8.38	167.60	4.56
200 yards stone loaded, at $0.37	74.00	2.01
20 feet bank graded, at $4.05	81.00	2.20
12 days' towing, at $75.67	908.04	24.72
Supervision	124.33	3.38
Sundries	797.23	21.70
Total	3,674.10	100.00

STATEMENT No. 8.—*List of floating plant belonging to the third district.*

Name or number.	Pieces.	Name or number.	Pieces.
Steamer Arthur Hider	1	Steel barges, first class	4
Steamer H. St. L. Coppee	1	Line barges	3
Steamer Control	1	Grader No. 2	1
Tug Parker	1	Dry dock, steel	1
Gasoline yawls	2	Skiffs	23
Mattress boats	6	Boats, calking	5
Headquarter boat, No. 31	1	Carpenter shop and outfit	1
Quarter boats	11	Machine shop and outfit	1
Square barges:		Mooring barges	6
First class	17	Loading barges	2
Second class	8		
Third class	7	Total	103

Statement No. 9.—*Cost of repairs to plant, May 1, 1910, to April 30, 1911.*

Name or number.	Cost.	Work done.
Steamer:		
Arthur Hider	$1,203.96	Docked at Rock Island, Ill., district boat yard at Keokuk, Iowa. Hull scraped and painted; ordinary repairs during the year.
H. St. L. Coppee	1,634,37	Machinery, boilers, and pipe work overhauled; painted; minor repairs.
Control	740.23	Painted; furnace, wheel, fenders, stage, roof, and exhaust pipes repaired; engines, pumps, and doctor overhauled.
Chisca	329.66	Boiler repaired; deck sheathed; siphon, exhaust pipe, chains, wheel, fenders, and guards repaired.
Columbia	47.24	Making stirrups; wheel repaired.
Launch Ouachita	22.04	Pulley and flagstaff made; pump changed.
Tug Parker	52.70	Repairing pipe, pump, and engine; batten calked.
Grader:		
No. 1	3,461.20	Sides sheathed; raising, testing, and covering boilers; packing pumps; deck, sides, and rakes calked; nigger boiler put in; boilers scaled; deck, roof, dynamo, and feed pumps repaired; flues in boiler replaced.
No. 2	959.36	Deck, sides, and rakes calked; gunwales, deck, deck beams, plank sheer, electric-light machinery, and pump repaired; pipe fittings, nozzles, stands, hose clamps, cylinder rings, and reamers made; headlight put in.
Carpenter shop No. 78	239.02	Sides and rakes calked; taking out and putting in engine; making patterns for same; replacing machinery; 3 timberheads put in; engine, deck, and hoods repaired; heater made.
Machine shop No. 222	1,612.01	Docked; engine, punch and shear machine and guards repaired; feed pump, shaft, punch and shear machine put in; cylinder timbers and five timberheads put in. Still on dock.
Quarter boat:		
No. 17	271.71	Calking deck and sides; fenders made; deck guards, deck beams, nosing, and range repaired.
No. 86	56.42	Docked. Calked throughout; 16 bottom planks put in.
No. 87	273.15	Deck, sides, and rakes calked; gunwales, deck, deck beams, and stovepipe repaired.
No. 88	184.36	Deck, sides, and rakes calked; guards and rakes repaired.
No. 31	130.68	Upper and lower deck and windows and doors repaired; sides and rakes calked.
No. 155	1,587.71	Docked. Bunks changed; cabin rebuilt and ceiled at one end; sides and rakes renewed; deck and deck beams on one end repaired; headblock put in; painted.
No. 156	1,445.30	Docked. Sides and rakes renewed; 40 outriggers and 40 beams put in; painted; tables, benches, and ranges repaired.
No. 157	1,541.96	Docked. New sides; headblocks on 1 end; 3 timberheads in beams; outriggers and bulkhead put in; roof repaired; water tank repaired; bunks changed; painted.
Gasoline skiff	175.97	Calked and painted; tank and shaft log put in; engine installed.
Quarter boat:		
No. 158	76.39	Guards repaired; 3 pieces in side.
No. 159	1,618.19	Docked. Bunks changed; gunwales cut out; rakes, beams, and outriggers put in; pipe connections, pump, and cabin repaired; painted.
No. 1010	1,623.80	Ranges, heating stoves, tables, and water supply put in; storeroom and office enlarged; hog chains and water tank made.
Mat boat:		
No. 28	1,838.07	Docked. Torn down; skids and outriggers made; all gunwales and streamers put in on 1 side; new rakes, bitts, and deck on end; bottom and sides calked; deck, skids, brakes, and platform repaired.
No. 29	1,884.66	Same as mat boat No. 28.
No. 075	100.00	Skids and outriggers made; sides and rakes calked.
No. 076	138.90	
No. 0810	123.66	Skids and outriggers made; plank-sheer repaired; sides and rakes calked.
No. 089	166.96	
Barge:		
No. 564	485.23	Docked. Sides, rakes, and bottom calked; 2 pieces of gunwale, 8 bottom pieces, and 2 iron kevels put in; painted.
No. 567	186.24	Deck, sides, and rakes calked; hoods, rakes, deck, and gunwales repaired; timberhead put in.
No. 568	778.32	New gunwales, except top strake; rake plank put in; calked halfway up; shed covered with duck; painted.
No. 571	20.31	Deck repaired.
No. 572	88.89	Sides and rakes calked; rake and plank-sheer repaired.
No. 573	15.89	3 timberheads put in.
No. 574	38.87	Sides and rakes calked; 6 timberheads put in; whitewashed.
No. 575	1,332.32	Docked. New gunwales, except top strake; rake pieces put in halfway up; calked throughout; rakes repaired.
No. 580	31.90	Sides and rakes calked.
No. 577	7.18	Sides calked.

STATEMENT No. 9.—*Cost of repairs to plant, etc.*—Continued.

Name or number.	Cost.	Work done.
Barge—Continued.		
No. 581	$145.24	Made into mooring barge; sides, rakes, and deck calked; heads repaired.
No. 582	739.88	Made into mooring barge; new deck and part of deck beams; deck and rakes calked.
No. 584	10.55	Sides and rakes calked.
No. 585	1,970.38	Docked. Deck, headblocks, beams, sides, and rakes torn off and renewed; bottom, sides, and rakes calked.
No. 586	2,631.27	Docked. Made into loading barge; sides, rakes cut out and renewed; platform for loading built; floor and stage built for loading purposes; apron sheathed; deck patched; derricks and stage rigging put up; bottom, sides, and rakes calked.
No. 587	62.07	General repairs to make good wear and tear of operation.
No. 588	10.55	Do.
No. 589	567.48	Do.
No. 071	40.78	Do.
No. 072	203.19	Do.
No. 073	36.34	Do.
No. 074	136.42	Do.
No. 077	170.85	Do.
No. 078	119.71	Do.
No. 079	637.26	Do.
No. 07x	5.38	Do.
No. 081	3.59	Do.
No. 082	54.91	Do.
No. 083	428.59	Do.
No. 084	268.58	Do.
Skiffs	401.74	7 built; minor repairs made to old ones.
Barge:		
No. 086	670.56	Docked; calked throughout; repairs to bottom; sides and open scarfs rebolted.
No. 101	107.45	Minor repairs and calking.
No. 102	36.71	Do.
No. 103	22.84	Do.
No. 104	87.22	Do.
No. 105	35.18	Do.
No. 106	16.83	Do.
No. 108	62.05	Do.
No. 109	35.76	Do.
No. 111	10.55	Do.
No. 112	110.02	Do.
Upper Tensas Levee district	25.20	Making water gauges.
Dry dock:		
Old	469.79	Patch put on boiler; engines and pumps overhauled; dismantled; beached; burned.
Steel	1,040.97	Air and water valves installed; blocking and fenders placed; engine tested; siphons put in.
Steamer Ramus	4.14	Repairing rudder.
Construction	5,311.89	Cable couplings, siphon couplings, yokes, coal boxes, capstan bars, wheel wrenches, wire twisters, ice hooks, etc., made; tools repaired; outfitting quarter boats and steamboats.
Pumps, barge	138.59	Repairs during the season.
General repairs	849.72	Overhauling old machinery; care of property and machinery.
Wages account	2,439.81	Supervision of above work.
Stone	23.38	Repairing wheelbarrows.
Yawl, T. R	28.00	Repairs during the season.
Total	46,758.49	

STATEMENT No. 10.—*Levee work in the Lower Yazoo levee district from May 1, 1910, to May 1, 1911.*

Stations.	Miles below Cairo.	Contractor.	In contract.	Placed this year.	Total laborers.	Total teams.
			Cu. yds.	*Cu. yds.*		
950 to 1000	381	Shields Bros. & Nystrom	75,276	63,971	3,918	2,820
1328 to 1500	397	do	195,139	36,450	1,785	1,301
		do	934	266		
2400 to 2550	416	do	178,613	91,348	4,079	3,047
4733 to 4760	568	Clark, Bobbitt & Co	107,241	107,241	4,464	3,593
4760 to 4777	568	do	83,119	83,119	3,851	3,017
4777 to 4795	568	do	92,429	92,429	4,002	3,127
4795 to 4812	568	do	88,643	88,643	3,877	3,068
4812 to 4838	569	do	97,445	97,445	4,680	3,744
4838 to 4862	569	do	106,555	106,555	4,668	3,558
4862 to 4884+74	569	do	101,885	101,885	5,086	3,909
1717 to 1810	400	Helgason Bros	93,000	(1)		
1810 to 1900	400	do	85,000	32,644	1,468	1,163
2400 to 2550	416	Shields Bros. & Nystrom	3,625			
4853	569	R. T. Clark	4,765	4,765	222	129
Total			1,313,669	906,761	42,100	32,476

Stations.	Miles below Cairo.	Total scrapers.	Yards per team.	Yards per scraper.	Price per cubic yard.	Average height.	Average haul.	Kind of work.
					Cents.	*Feet.*	*Feet.*	
950 to 1000	381	1,767	23	36	25.25	22.3	211	Enlargement.
1328 to 1500	397	851	28	43	21.85	18.6	220	Do.
					18.00			Drain ditch.
2400 to 2550	416	2,006	30	46	22.69	21.8	200	Enlargement.
4733 to 4760	568	2,250	30	48	18.50	16.9	232	New work.
4760 to 4777	568	2,008	28	41	18.00	20.4	228	Do.
4777 to 4795	568	2,093	30	44	18.00	19.7	210	Do.
4795 to 4812	568	2,090	29	42	19.00	19.5	231	Do.
4812 to 4838	569	2,451	26	40	16.75	16.6	202	Do.
4838 to 4862	569	2,358	30	45	19.90	17.3	200	Do.
4862 to 4884+74	569	2,588	26	39	19.90	17.6	222	Do.
1717 to 1810	400				14.40			Enlargement.
1810 to 1900	400	738	28	44	14.40	18.5	250	Do.
2400 to 2550	416							Drain ditch.
4853	569	[2] 120	37	40	30.00		53	Do.
Total		21,320	28	42	19.53	18.5	215	

Not commenced.

[2] Drag scrapers.

STATEMENT No. 11.—*Rainfall at Greenville, Miss., from May 1, 1910, to May 1, 1911.*

Month.	Rainfall.	Mean for 25 years.
1910.	*Inches.*	*Inches.*
May	5.90	4.21
June	5.23	3.90
July	5.76	4.23
August	5.86	3.62
September	.02	2.97
October	4.45	2.06
November	.69	3.70
December	4.52	4.51
1911.		
January	3.30	4.73
February	6.32	4.49
March	3.18	5.47
April	8.07	4.08
Total	53.30	47.97

STATEMENT No. 12.—*Levee construction by the Mississippi Levee Board, May 1, 1910, to May 1, 1911.*

Stations.	Miles below Cairo.	Cubic yards placed.	Price per cubic yard.	Total expended.	Kind of work.
			Cents.		
Above Greenville:					
501	373	3,000	(1)	$705.00	Repairing spur dike.
600 to 715	376	47,983	[2] 16.90	9,233.63	Enlargement.
715 to 862	378	107,149	[2] 25.00	27,689.35	Do.
1038 to 1226	393	18,717	(1)	6,043.06	Topping and repairing.
1575 to 1664	400	558,519	21.25	118,685.29	New loop.
2670 to 2785	418	21,133	[2] 24.00	9,295.20	Enlargement.
3330 to 3547	440	5,854	[3] 30.20	1,502.72	Do.
2547 to 3601	445	17,113	[2] 26.00	6,852.37	Do.
3885	460	2,448	(1, 4)	2,772.69	Repairing spur dike.
Below Greenville:					
520 to 670	492	43,259	[3] 21.00	7,721.73	Enlargement.
1570 to 1650	503	11,983	[2] 17.98	3,359.50	Enlargement and banquette.
1771+60	505	24,881	18.76	4,667.68	New spur dike.
1776 to 2109	512	4,567	(1)	1,566.65	Repairing wave wash, etc.
4109 to 4198	554	35,443	[2] 26.95	11,762.01	Enlargement.
4233 to 4321	556	369,041	16.00 16.40	59,630.85	New loop.
4741 to 4773	568	5,161	15.00	774.15	Ditch along Albemarle loop
5000 to 5160	572	33,475	[2] 22.00	11,920.51	Enlargement.
Total		1,309,746		[5] 284,184.39	

[1] Day force.

[2] Retained 15 per cent on work of previous year included.

[3] Retained 15 per cent not included.

[4] Includes $1,736.22 for 11,433 square feet of concrete paving to protect end of dike.

[5] Does not include $35,346.93 expended for rights of way for levee board and United States; $482.80 for high-water protection, and $5,310.81 for weed cutting, sodding, and repairing road crossings.

Engineering and inspection not included in above.

No charge for cost of general administration included in above.

STATEMENT No. 13.—*Levee work in the upper Tensas levee district, May 1, 1910, to May 1, 1911.*

Stations.	Miles below Cairo.	Contractors.	In contract.	Placed during year.	Total laborers.	Total teams.
			Cu. yds.	*Cu. yds.*		
871 to 916	Ark. R.	W. T. & E. M. Lowrance	115,782	[1] 115,782	5,927	4,313
920 to 942	Ark. R.	do	93,962	[1] 93,962	5,861	4,060
942 to 957	Ark. R.	do	61,358	[1] 61,358	3,109	2,327
360 to 390	427	Roach & Stansell	47,376	[1] 38,067	2,965	2,301
1240 to 1360	442	Shields Bros. & Nystrom	78,281	[1] 3,610	4,352	2,928
1940 to 2050	467	Clark & Parker	106,611	[1] 86,702	5,412	4,056
1865 to 1985	548	Helgason Bros	111,700	101,143	6,375	4,502
2805 to 2860	576	H. F. Garbish	53,029	[1] 53,029	1,996	1,573
3070 to 3160	579	Donaven & Daley	90,101	[1] 90,101	4,406	3,280
Total			758,200	643,754		

Stations.	Miles below Cairo.	Total scrapers.	Cubic yards per scraper.	Cubic yards per team.	Price per cubic yard.	Average—		Kind of work.
						Height.	Haul.	
					Cents.	*Feet.*	*Feet.*	
871 to 916	Ark. R.	2,625	44	27	32.7	18.5	350	New.
920 to 942	Ark. R.	2,598	36	23	35.0	19.3	400	Do.
942 to 957	Ark. R.	1,508	41	26	35.0	20.0	400	Do.
360 to 390	427	[2] 1,560	30	26	33.0	22.0	635	Enlargement.
1240 to 1360	442	1,802	43	27	18.49	14.4	304	Do.
1940 to 2050	467	2,710	40	26	19.9	16.0	250	Do.
1865 to 1985	548	2,912	35	22	25.95	20.6	348	Do.
2805 to 2860	576	1,008	52	34	15.7	16.0	220	Do.
3070 to 3160	579	2,081	43	28	19.35	17.0	260	Do.

[1] Contracts completed during period.

[2] Used 60 dump wagons, estimated equal to 2 scrapers each.

STATEMENT No. 14.—*Levee construction by the State of Louisiana, and the levee boards in Arkansas and Louisiana, from May 1, 1910, to May 1, 1911.*

Levee board.	Stations.	Miles below Cairo.	In contract.	Placed during year.	Price per cubic yard.	Amount expended.	Kind of work.
In Arkansas:			*Cu. yds.*	*Cu. yds.*	*Cents.*		
Red Fork	916 to 919	Ark. R.	13,530	[1] 13,530	32.7	$4,424.31	New levee.
	950 to 953	Ark. R.	19,434	[1] 19,434	35.0	6,801.90	Do.
Chicot	3223	496	10,182	[1] 10,182	18.0	1,832.76	Spur dike.
	3820 to 3950	512	51,159	[1] 51,159	18.0	9,208.62	Enlargement.
	3950 to 4050	512	88,828	[1] 38,209	21.0	9,890.63	Do.
Tensas Basin	463 to 529	428	335,000		20.82		New levee.
	650 to 699	430	364,124	[1] 56,524	24.0	13,565.76	Do.
	650 to 699	430	30,525	[1] 325	18.0	58.50	Ditch.
	675 to 684	430	11,870	[1] 11,870	39.5	4,688.65	Repairing sinking levee.
	675 to 684	430	3,666	[1] 3,666	26.9	986.15	Ditch.
	1020 to 1240	440	285,509	[1] 282,809	26.9	76,075.62	Enlargement.
	1020 to 1240	440	4,227	[1] 4,227	26.9	1,137.07	Ditch.
In Louisiana:							
State of Louisiana	2714 to 2805	565	43,974	20,653	15.7	2,600.00	Enlargement.
	3160 to 3251	580	100,911	[1] 100,911	16.23	16,377.85	Do.
Fifth Louisana	930 to 1008	530	62,565	[1] 62,565	17.35	10,855.03	Do.
	1060 to 1086	535	28,655	[1] 4,655	23.9	1,112.54	Do.
	1284 to 1440	540	81,000	39,000	23.0	7,176.00	Do.
	1645 to 1810	545	190,376	27,200	22.3	4,852.48	Do.
	2110 to 2132	555	24,013	[1] 24,013	17.9	4,298.33	Do.
	2227 to 2253	560	48,083	[1] 43,083	12.44	9,237.00	New levee.
	2264 to 2369	560	119,200	[1] 119,200	17.9	21,336.80	Enlargement.
	2930 to 2965	575	100,000		14.48		Do.
	2965 to 2999	575	150,000		14.48		New levee.
	2999 to 3092	575	422,393	170,600	15.4	21,017.92	Do.
	4428 to 4633	605	66,000	44,700	23.9	8,546.64	Banquette.
Summary:							
In Arkansas			1,218,054	491,935		128,699.97	
In Louisiana			1,432,170	656,580		107,410.59	
Grand total			2,650,224	1,148,515		236,080.56	

[1] Contracts completed during period.

MISSISSIPPI RIVER COMMISSION, THIRD DISTRICT.

FINANCIAL STATEMENT.

Appropriations for improving Mississippi River, third district.

SURVEYS, THIRD DISTRICT.

July 1, 1910, balance unexpended	$141.46
Amount allotted from sundry civil act approved June 25, 1910	5,000.00
Amount allotted from river and harbor act approved Feb. 27, 1911	5,000.00
	10,141.46
June 30, 1911, amount expended during fiscal year	5,160.73
July 1, 1911, balance unexpended	4,980.73
July 1, 1911, outstanding liabilities	500.00
July 1, 1911, balance available	4,480.73
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	10,000.00
Minimum	5,000.00

LOWER YAZOO LEVEE DISTRICT.

July 1, 1910, balance unexpended	$85,108.43
Amount allotted from sundry civil act approved June 25, 1910	160,000.00
	245,108.43
June 30, 1911, amount expended during fiscal year	189 179.65
July 1, 1911, balance unexpended	55,928.78
July 1, 1911, outstanding liabilities	700.00
July 1, 1911, balance available	55,228.78
July 1, 1911, amount covered by uncompleted contracts	27,100.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	150,000.00
Minimum	100,000.00

UPPER TENSAS LEVEE DISTRICT.

July 1, 1910, balance unexpended	63,589.19
Amount allotted from sundry civil act approved June 25, 1910	120,000.00
	183,589.19
June 30, 1911, amount expended during fiscal year	177,387.42
July 1, 1911, balance unexpended	6,201.77
July 1, 1911, outstanding liabilities	1.77
July 1, 1911, balance available	6,200.00
July 1, 1911, amount covered by uncompleted contracts	6,200.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	150,000.00
Minimum	100,000.00

PANTHER FOREST, ARK.

Amount allotted from sundry civil act approved June 25, 1910	20,000.00
Amount allotted from river and harbor act approved June 25, 1910	20,000.00
	40,000.00
June 30, 1911, amount expended during fiscal year	40,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	70,000.00
Minimum	35,000.00

VAUCLUSE, ARK.

July 1, 1910, balance unexpended	1,081.18
Amount allotted from sundry civil act approved June 25, 1910	20,000.00
Amount allotted from river and harbor act approved June 25, 1910	20,000.00
Amount allotted from river and harbor act approved Feb. 27, 1911	35,000.00
	76,081.18
June 30, 1911, amount expended during fiscal year	41,081.18
July 1, 1911, balance unexpended	35,000.00
July 1, 1911, outstanding liabilities	2,500.00
July 1, 1911, balance available	32,500.00

July 1, 1911, amount covered by uncompleted contracts	$2,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913: Maximum	35,000.00

FITLERS BEND, MISS.

Amount allotted from sundry civil act approved June 25, 1910	20,000.00
Amount allotted from river and harbor act approved June 25, 1910	20,000.00
	40,000.00
June 30, 1911, amount expended during fiscal year	25,196.46
July 1, 1911, balance unexpended and available	14,803.54
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	70,000.00
Minimum	35,000.00

ALBEMARLE BEND, MISS.

Amount allotted from river and harbor act approved June 25, 1910	400,000.00
June 30, 1911, amount expended during fiscal year	400,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	140,000.00
Minimum	70,000.00

GREENVILLE, MISS.

Amount allotted from sundry civil act approved June 25, 1910	40,000.00
June 30, 1911, amount expended during fiscal year	11,840.71
July 1, 1911, balance unexpended and available	28,159.29
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	175,000.00
Minimum	70,000.00

LAKE BOLIVAR FRONT, MISS.

Amount allotted from river and harbor act approved Feb. 27, 1911	70,000.00
July 1, 1911, balance unexpended	70,000.00
July 1, 1911, outstanding liabilities	5,000.00
July 1, 1911, balance available	65,000.00
July 1, 1911, amount covered by uncompleted contracts	4,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	70,000.00
Minimum	35,000.00

ASHBROOK NECK, MISS.

Amount allotted from river and harbor act approved Feb. 27, 1911	35,000.00
July 1, 1911, balance unexpended	35,000.00
July 1, 1911, outstanding liabilities	2,500.00
July 1, 1911, balance available	32,500.00
July 1, 1911, amount covered by uncompleted contracts	2,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	140,000.00
Minimum	70,000.00

LELAND NECK, ARK.

Amount allotted from river and harbor act approved Feb. 27, 1911	$35,000.00
July 1, 1911, balance unexpended	35,000.00
July 1, 1911, outstanding liabilities	2,500.00
July 1, 1911, balance available	32,500.00
July 1, 1911, amount covered by uncompleted contracts	2,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	70,000.00
Minimum	35,000.00

GRAND LAKE, ARK.

Amount allotted from river and harbor act approved Feb. 27, 1911	140,000.00
July 1, 1911, balance unexpended	140,000.00
July 1, 1911, outstanding liabilities	10,000.00
July 1, 1911, balance available	130,000.00
July 1, 1911, amount covered by uncompleted contracts	8,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	70,000.00
Minimum	35,000.00

REID-BEDFORD BEND, LA.

Amount allotted from river and harbor act approved Feb. 27, 1911	35,000.00
July 1, 1911, balance unexpended	35,000.00
July 1, 1911, outstanding liabilities	2,500.00
July 1, 1911, balance available	32,500.00
July 1, 1911, amount covered by uncompleted contracts	2,000.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	70,000.00
Minimum	35,000.00

PLANT, THIRD DISTRICT.

July 1, 1910, balance unexpended	98,780.16
Amount allotted from sundry civil act approved June 25, 1910	80,000.00
Amount allotted from river and harbor act approved June 25, 1910	100,000.00
Amount allotted from river and harbor act approved Feb. 27, 1911	240,000.00
Amount received from sale of property, reallotted	340.00
	519,120.16
June 30, 1911, amount expended during fiscal year	156,856.59
July 1, 1911, balance unexpended	362,263.57
July 1, 1911, outstanding liabilities	86,500.00
July 1, 1911, balance available	275,763.57
July 1, 1911, amount covered by uncompleted contracts	117,940.00
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
Maximum	225,000.00
Minimum	150,000.00

REPAIRS TO EXISTING WORKS AND STONE.

July 1, 1910, balance unexpended		$60,979.26
Amount allotted from sundry civil act approved June 25, 1910		75,000.00
Amount allotted from river and harbor act approved Feb. 27, 1911		85,000.00
		220,979.26
June 30, 1911, amount expended during fiscal year, account different works, as follows:		
Upper Tensas Levee district (Red Fork revetment)	$2,490.38	
Panther Forest, Ark	28,369.56	
Vaucluse, Ark	7,331.31	
Fitlers Bend, Miss	1,075.39	
Albemarle Bend, Miss	11,802.57	
Plant, third district	8,912.42	
Greenville, Miss	1 485.55	
Lake Bolivar front, Miss	5,480.01	
Ashbrook Neck, Miss	2,731.73	
Leland Neck, Ark	61,845.84	
Grand Lake, Ark	10,926.91	
Reid-Bedford Bend, La	2,815.06	
Lake Providence Reach, La	9.51	
		145,276.24
July 1, 1911, balance unexpended		75,703.02
July 1, 1911, outstanding liabilities		7,000.00
July 1, 1911, balance available		68,703.02
Amount that can be profitably expended in fiscal year ending June 30, 1913:		
Maximum		200,000.00
Minimum		100.000 00

Abstract of contracts in force June 30, 1911.

Name of contractor.	Character and amount of material or articles contracted for.	Unit price.	Date of— Approval.	Date of— Beginning.	Date of— Expiration.
Helgason Bros	111,700 cubic yards levee work.	25.95 cents	Aug. 20, 1910	Sept. 1, 1910	Jan. 1, 1911[1]
Do	93,000 cubic yards levee work.	14.4 cents	Dec. 1, 1910	([3])	Jan. 1, 1912
Do	85,000 cubic yards levee work.	do	do	Jan. 3, 1911	Do.
Roach & Stansell	65,000 cubic yards levee work.	10.98 cents	([2])	May 1, 1911	Sept. 30, 1911
American Bridge Co. of New York.	3 steel barges	$8,900 each	June 2, 1911	([3])	June 1, 1912
West Kentucky Coal Co.	250,000 bushels coal.	$0.0975 to $0.1355 per bushel.	Apr. 11, 1911	Apr. 26, 1911	([4])
American Bridge Co. of New York.	4 steel barges	$8,900 each	June 30, 1911	([3])	
Ed J. Howard	1 steel-hull towboat.	$55,640		([3])	

[1] Time limit waived.
[2] Emergency contract.
[3] Not begun.
[4] Indeterminate.

Data of cost of revetment, May 1, 1910, to May 1, 1911.

[Submitted in compliance with resolution of the Mississippi River Commission.]

	Expended as per financial statement.	Debits: To material transferred from reserve, etc.	Credits: By material transferred to reserve, etc.	Construction.	Repairs.	Surveys.	Care, repairs, and deterioration of plant.	Total.
Lake Boliver front, Miss	[1] $16.56				$16.56	$205.90	$3,071.45	$3,293.91
Ashbrook Neck, Miss						595.66	8,883.55	9,479.21
Panther Forest, Ark	40,063.53 [1] 29,416.81	$4,853.99	$6,469.11	$67,865.22		240.70	6,467.24	74,573.16
Leland Neck, Ark	474.62 [1] 58,982.55	4,495.74	6,210.74	57,742.17		243.60	6,081.27	64,067.04
Greenville, Miss	11,984.69 [1] 1,485.55	2,480.22	11,266.98		4,683.48	725.00	11,011.08	16,419.56
Vaucluse, Ark	47,966.58 [1] 4,599.58	5,581.64	19,181.94	38,965.86		156.60	3,987.65	43,110.11
Longwood, Miss						243.60	3,633.00	3,876.60
Louisiana Bend, La						655.40	9,774.50	10,429.90
Lake Providence Reach, La	[1] 9.51				9.51	730.34	10,883.84	11,623.69
Fitlers Bend, Miss	26,748.00 [1] 1,083.39	314.04	17,201.75		10,943.68	185.60	3,232.01	14,361.29
Albemarle Bend, Miss	399,772.58 [1] 11,802.57	78,252.30	11,081.21	478,746.24		675.70	30,374.04	509,795.98
Delta Point, La						342.20	5,103.50	5,445.70
Reid-Bedford Bend, La.	146.93 [1] 1,027.28		1,090.88		83.33	203.00	3,031.03	3,317.36
Upper Tensas Levee District at Red Fork, Ark	[1] 2,540.38	1,225.24	456.37		3,309.25	69.60	1,178.31	4,557.16
Total	638,121.11	97,203.17	72,958.98	643,319.49	19,045.81	5,272.90	106,712.47	774,350.67

[1] Amount expended for account this work from allotments for "General repairs to existing works" and "Repairs to existing works and stone."

APPENDIX 4.

REPORT OF MAJ. HARRY BURGESS, CORPS OF ENGINEERS, ON OPERATIONS IN THE FOURTH DISTRICT.

MISSISSIPPI RIVER COMMISSION, FOURTH DISTRICT,
New Orleans, La., May 31, 1911.

COLONEL: I have the honor to submit the following report upon the work of the fourth district, Mississippi River improvement, for the year ending May 31, 1911.

The fourth district extends from Warrenton, Miss., 7½ miles below Vicksburg, Miss., to the Head of Passes, about 13 miles from the Gulf of Mexico, a distance of 452.8 miles by river.

The works include bank protection in Hard Times Bend, in Bondurant Chute, and in Kempe Bend; the improvement of the harbors at Natchez, Miss., and Vidalia, La.; improvement at the junction of the Mississippi, Red, and Atchafalaya Rivers; improvement of the harbor at New Orleans, La.; and the construction, repair, and maintenance of the levee system of the district. During the year the Reid-Bedford revetment and reach was temporarily in charge of this office. The fourth district forces also constructed a portion of the Albemarle Bend revetment. Both of these latter works are located in the third district.

1. ALBEMARLE BEND REVETMENT.

At date of last report no work had been done at this locality. The work projected for the past season was to construct and place about 15,000 linear feet of standard revetment, and to accomplish this large amount of work during one low-water season it was planned to operate revetment parties from the first and second, from the third, and from the fourth Mississippi River districts.

The fourth district revetment party commenced work on October 1, 1910, and completed 1,615 linear feet of revetment on January 30, 1911. Operations were not continuous, as the revetment was completed up to the 25-foot stage by November 15, 1910, and lack of rock compelled a suspension of operations from that date until January 13, 1911.

Mattress construction.—On account of lack of familiarity with this portion of the river and difficulty in obtaining a suitable willow-bar mattress construction was somewhat slow. A sudden rise of the river and the caving in of one set of ways tended to delay the work and to increase the cost, as did also the necessity of bringing some of the brush by barges from a considerable distance. The field cost was as follows:

90,230 feet b. m. 3 by 6 inch lumber	$1,398.56
140,000 feet b. m. 2 by 4 inch lumber	2,170.00
2,000 feet b. m. miscellaneous lumber	31.00
6,000 pounds 9-inch steel wire nails	138.00
16,600 pounds 6-inch steel wire nails	348.60
5,000 pounds 4-inch steel wire nails	105.00
3,500 pounds No. 12 galvanized wire	82.25
4,100 cords brush	5,398.62
10,000 9-inch treenails	28.80
40,000 6-inch treenails	107.20
Steamers and tugs	1,825.00
Miscellaneous	40.60
Provisions	1,318.58
Pay rolls, services	5,371.96
Total	18,364.17
Square feet of mattress built	394,620
Cost per square foot for construction	$0.04653

Brush.—The item of 4,100 cords of brush given in the foregoing table is analyzed as follows:

Cutting and piling, building roads, etc	$4,047.29
Transportation to ways	1,184.37
Privilege of cutting brush	166.96
Total	5,398.62
Estimated cords of brush used	4,100
Cost per cord delivered at ways	$1.316

Of the 4,100 cords of brush used, 750 cords had to be transported from outlying bars on barges.

Ways.—Three sets of ways had to be built, one on the mainland at Salem, one on the towhead, and one on Arcadia bar. Their cost is included in mattress construction, but is separated and analyzed as follows:

Lumber and nails	$161.60
Labor and superintendence	425.07
Total	586.67
Average cost of each set	195.56

Towing.—As has been customary the expense of towing lumber and other materials, except rock, has been added to and is included in the cost of such materials delivered at the site of the work. As Salem bar is located only a short distance above Albemarle Bend, the cost of towing the mattresses from the place where built to the locality where sunk is too small to be given as a separate item, and is included in the cost of construction and sinking.

Sinking.—The sinking plant arrived in Albemarle Bend on October 13, 1910. The first mattress was successfully sunk in place on October 17. The sinking of mattresses in revetment progressed rapidly until October 26, when all mattresses afloat had been placed. The sinking force was temporarily transferred to Salem bar to assist in mattress construction, returning to Albemarle Bend on October 30. The placing of mattresses in revetment was resumed immediately and completed on November 15, 394,620 square feet covering 1,615 linear feet of bank having been placed. Field cost was as follows:

487 tons of rock, at $2.40	$1,168.80
2,473.61 tons of rock, at $2.25	5,565.62

Steamers and tugs	$2, 105. 00
Lumber, wire nails, wire, etc	432. 56
Miscellaneous	64. 74
Provisions	990. 34
Pay rolls, services	3, 110. 69
Total	13, 437. 75
Cost per square foot to sink	$0. 03405

Summarizing the field cost of construction and sinking we have:

Construction of mattress per square foot,	$0. 04653
Sinking of mattress per square foot	. 03405
Total field cost per square foot	. 08058

Grading bank.—All grading was done with hydraulic *Grader No. 2.* Operations were commenced November 3 and completed November 13, during which time 1,586 linear feet of bank was graded. The grader was operated with a single crew. The total cost of grading 1,586 linear feet of bank was $2,045.55, being $1.29 per linear foot.

Paving bank.—A total of 129,121 square feet, covering 1,635 linear feet of bank, was paved up to a stage of 35 feet on the Vicksburg gauge. The cost was as follows:

Steamers and tugs	$877. 00
1,271.19 tons of rock, at $2.40	3, 050. 86
1,271.71 tons of rock, at $2.32	2, 950. 37
437.04 tons of rock, at $2.25	983. 34
896 tons of rock, at $1.93	1, 729. 28
Miscellaneous	35. 00
Provisions	441. 62
Pay rolls, services	1, 606. 95
Total	11, 970. 42
Cost per square foot for paving	$0. 0919

Clearing.—Clearing bank of logs, etc., preparatory to grading cost, $375.30.

Rock.—Rock for this work was obtained from various sources and at various prices. A total of 6,836.55 tons was used, of which 3,806.65 tons was obtained under contract delivered on barges at Vicksburg, Miss., 1,758.19 tons delivered on barges in Albemarle Bend, and 1,271.71 tons purchased in open market delivered on railroad cars at Vicksburg, Miss. The lack of rock at times delayed the work and increased its cost.

Installation.—The same plant was used in Albemarle Bend as was operated at Reid-Bedford, and the actual expense of moving it upstream about 40 miles was not very great, but has been prorated with the Reid-Bedford work and assumed to be $1.500.

Surveys.—The cost of such survey work as was necessary to the location and placing of the revetment was $129.

Summary.—The total length of completed revetment placed was 1,615 linear feet and the total field cost was $49,884.19, analyzed as follows:

Construction of mattress, including three sets of ways	$18, 364. 17
Sinking of mattress	13, 437. 75
Grading bank	2, 045. 55
Paving bank	11, 970. 42
Clearing	375. 30
Installation, estimated	1, 500. 00
Surveys	129. 00
Miscellaneous	62. 00
New plant, manila rope, etc., estimated	2, 000. 00
Total field cost	49, 884. 19
Total field cost per linear foot of completed revetment	$30. 89

As the disbursements for this work were made by the officer in charge of the third Mississippi River district, there should be added to the above total a due proportion of office and administrative expenses for the 61 days on which the fourth district forces were engaged in Albemarle Bend.

The total length of the revetment placed by the fourth district forces in Albemarle Bend is 1,615 linear feet, all of which, so far as known, is in good condition.

The field work was in charge of Assistant Engineer H. S. Douglas, assisted by Junior Engineers G. D. Waddill, T. M. McCarroll, and J. H. Lewis.

2. REID-BEDFORD REVETMENT.

For history of this work, project, and details of its execution, see current summary and annual reports of the Mississippi River Commission since 1907.

At date of last report the total length of bank protected was about 3,700 linear feet, and was stated to be in good condition.

The work proposed during the past season was to extend the revetment about 2,000 feet upstream and to make necessary repairs to the existing revetment.

Field work was commenced July 21, 1910, and was completed January 10, 1911, all work being suspended on account of lack of rock from October 13 to November 21, 1910.

Mattress construction.—As this work was commenced when the river was at about a half stage, and as the employees were unfamiliar with the low-water conditions in this part of the river, some errors were made in the location of the ways, with the result that the cost of mattress construction was more than it would have been under favorable conditions. Detailed field cost is as follows:

103,986 feet b. m., 3 by 6 inch lumber	$1,611.78
205,398 feet b. m., 2 by 4 inch lumber	3,183.67
2,000 feet b. m., miscellaneous lumber	31.00
8,000 pounds 9-inch steel wire nails	184.00
19,600 pounds 6-inch steel wire nails	411.60
4,100 pounds 4-inch steel wire nails	86.10
2,400 pounds No. 12 galvanized wire	56.40
6,000 cords brush	6,912.65
10,000 9-inch treenails	28.80
40,000 6-inch treenails	107.20
Steamers and tugs	2,389.50
Miscellaneous	218.10
Provisions	2,387.32
Pay rolls, services	7,174.63
Total	24,782.75
Total square feet mattress built	573,100
Cost per square foot for construction	$0.04324

Brush.—The item of 6,000 cords of brush given in the foregoing table is analyzed as follows:

Cutting and piling, building roads, etc	$4,472.00
Transportation to ways	2,146.27
Privilege of cutting brush	294.38
Total	6,912.65
Estimated cords brush used	6,000
Cost per cord delivered at ways	$1.152

Ways.—Two sets of ways were built, one at Halpino bar and one at Paw Paw Island. Their cost is included in mattress construction but is separated and analyzed as follows:

Lumber and nails	$182.00
Labor and superintendence	268.60
Total	450.60
Average cost of each set	225.30

Towing.—As has been customary, the expense of towing lumber and other materials, except rock, has been added to and is included in the cost of such materials delivered at the site of the work. As Browns Point and Halpino bars, where the mattresses were built, is less than 30 miles above Reid-Bedford Bend, the cost of towing the mattresses from the place where built to the locality where sunk is too small to be given as a separate item, and is therefore included in the cost of construction and sinking.

Sinking.—The sinking plant arrived in Reid-Bedford Bend on August 24, 1910. On account of the swift current three towboats were required to handle the plant and mattresses. At times the current attained a velocity of 8 feet per second. No disasters occurred, but the cause stated made the work of placing mattresses slow and expensive. The last mattress was successfully sunk in place on October 13, 191 and the total field cost was:

4,289.93 tons rock	$9,661
Lumber, wire, wire nails, etc	588
Steamers and tugs	4,877
Miscellaneous	194
Provisions	2,022
Pay rolls, services	7,238
Total	24,582
Total square feet mattress sunk	573,
Cost per square foot to sink	$0.04

Summarizing the field cost of construction and sinking of mattresses in place w have:

Construction of mattress per square foot	$0.04
Sinking of mattress per square foot	.04
Total field cost per square foot in place	.08

Grading bank.—At the time that work was begun in Reid-Bedford Bend, this off had no hydraulic grader to spare. It was learned that one could be borrowed fr the third district for a limited time. It was believed that owing to the characte the bank it would have been best to defer grading until the subaqueous work had be placed, but owing to the great amount of work to be done here and elsewhere eve possible means to expedite operations was necessary. Accordingly the grader w borrowed and graded 1,959 linear feet of bank in advance of mattress placing. considerable portion of this work was partially destroyed by washing away of th foot of the graded slope, and regrading was necessary. This, as well as some gradi along the line of the work placed in former years, was done by the new hydra grader *No. 2* belonging to the fourth district. A total of 2,082 linear feet was grad and 1,017 linear feet was regraded, the cost being as follows:

Grading	$4,950
Regrading	1,814
Total	6,764
Cost per linear foot to grade	$2
Cost per linear foot to regrade	1

Paving bank.—A total of 119,066 square feet covering 1,750 linear feet of bank w paved on the extension of revetment and 31,169 square feet, covering 565 linear feet the repairs to work placed in previous years. The cost was as follows:

Steamers and tugs	$703
2,106.36 tons of rock, at $2.25	4,739
1,193.68 tons of rock, at $2.32	2,769
Miscellaneous	51
Provisions	837
Pay rolls, services	2,338
Total	11,538
Cost per square foot to pave	$0.0

Clearing.—Clearing bank for grader, felling timber and other similar work co $551.63.

Drainage.—Ditches were cut to drain borrow pits and former ditches were reope at a cost of $1,387.16.

Rock.—Proposals for furnishing about 10,000 tons of rock for this work were ope on July 22, 1910, and contract awarded for delivery on Government barges at Vic burg, Miss., at $2.25 per ton of 2,000 pounds. Of this amount 6,271.29 tons were us in Reid-Bedford Bend and the balance at other places. In addition, 1,193.68 to purchased in open market at $1.95 per ton delivered on railroad cars at Vicksbu Miss., was used. The cost of transferring from railroad cars to barges was 37 cents p ton, making the total $2.32 per ton on board barges.

Installation.—Reid-Bedford Bend is 370 miles upstream from New Orleans, and t locality from which brush for the work had to be obtained about 400 miles. All of th plant, consisting of 25 large pieces, quarter boats, barges, and grader, had to be towed up the river from the engineer depot to the site of the work. The item of fuel for towboats alone amounted to $1,743.96. As a consequence, the cost of operations preliminary to actual construction was unusually great, amounting to $3,861.30.

Surveys.—The regular annual hydrographic survey of the bend was made by the third district, in which the work is situated. The cost of survey work incidental to placing and locating the mattresses, including a new base line, was $374.

Summary.—The revetment was extended 2,040 feet upstream, and the revetment placed in former years was repaired over a distance of 565 linear feet, at a cost of $85,564.03, which is analyzed as follows:

Construction of mattress, including two sets of ways	$24, 782. 75
Sinking of mattress	24, 582. 24
Grading bank	6, 764. 21
Paving bank	11, 538. 87
Clearing	551. 63
Drainage	1, 387. 16
Installation	3, 861. 30
Surveys	374. 00
Miscellaneous	121. 73
Repairs to plant	263. 78
Care of plant	1, 034. 19
New plant	5, 583. 98
Office expenses and administration	4, 718. 19
Total expended	85, 564. 03

Of the above total there was expended on account of maintenance and repair of existing revetment the sum of $9,850.48. Deducting this amount, we have $75,713.55 as the total cost of the new revetment, which, divided by 2,040, gives $37.12 as the total cost per linear foot of completed new revetment. The field cost of the actual construction of revetment which does not include main-office expense, administration, etc., was $31.96 per linear foot, the difference being accounted for in the last four items of above table.

The revetment at Reid-Bedford has now a length of 5,740 linear feet, of which 2,040 feet was placed during the past season. Present condition is as follows: At the lower end of the revetment a considerable scour in the channel has occurred, and it may be that the channel mattress at this locality has been destroyed. The graded and paved bank has extensively subsided over both the old and new work.

The fieldwork was in charge of Assistant Engineer H. S. Douglas, assisted by Junior Engineers G. D. Waddill, T. M. McCarroll, and J. H. Lewis.

The amount expended from June 30, 1910, to June 30, 1911, is $85,830.83, distributed as follows:

Office expenses (main office)		$2, 486. 67
Other administrative expenses		2, 225. 10
Construction (hired labor):		
Materials	$30, 898. 10	
Wages	31, 252. 76	
Subsistence	12, 038. 30	
		74, 189. 16
Repairs to plant		283. 58
Care of plant		1, 034. 19
New plant		5, 583. 98
Miscellaneous		14. 82
Steamer *Newton*		13. 33
Total		85, 830. 83

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $5,195.31, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season, and at the engineer, depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $5,392.97.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
June 25, 1910 (sundry civil)	Apr. 30, 1910	$40,000.00
June 25, 1910 (river and harbor)	July 6, 1910	50,000.00
Total		90,000.00

3. HARD TIMES BEND.

No actual bank revetment has as yet been undertaken at this locality. The object of the proposed work is to prevent the destruction of the levee line across the bed of Lake St. Joseph, no other location of the levee line being practicable in the immediate vicinity, and its abandonment involving the construction of a loop several miles long around and behind the lake. In addition to the cost of constructing this new line of levee to replace the old one, the abandonment of the latter would result in the exposure to overflow of a large amount of cultivated land.

Under an allotment of $5,000 for clearing the bank, and for such other preliminary work as might be found necessary preparatory to bank protection, the timber along the bank has been felled from 300 to 400 feet back for a length of 6,200 feet. The bank line in the bend was located, and shows that rapid caving still continues opposite the upper end of the new levee. The average rate of caving at this point for the past seven years has been about 300 feet per year.

The total amount expended on account of this work from May 1, 1910, to April 30, 1911, was $1,792.76, distributed as follows:

Materials	$210.95
Pay rolls	661.23
Provisions	628.86
Miscellaneous	6.50
Care of plant	4.41
New plant	2.20
Office and administration	278.61
Total	1,792.76

The amount expended from June 30, 1910, to June 30, 1911, is $1,802.76, distributed as follows:

Office expenses (main office)		$128.61
Other administrative expenses		160.00
Construction (hired labor):		
Materials	$210.95	
Wages	661.23	
Subsistence	628.86	
		1,501.04
Care of plant		4.41
New plant		2.20
Steamer *Newton*		6.50
		$1,802.76

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $39.19, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season, and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $113.84.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
June 25, 1910 (river and harbor)	July 6, 1910	$5,000.00

4. BONDURANT CHUTE REVETMENT.

For history of this work, project, and details of its execution, see current summary, and annual reports of the Mississippi River Commission since 1901.

At the date of the last report the length of the revetment measured parallel to the general shore line was 3,550 feet and it was considered as a completed work, requiring only ordinary maintenance.

No work has been necessary at this locality during the past season. The survey made in July, 1910, shows that filling has taken place in the channel of the chute along practically all of the revetted bank. The bank line below the revetment has changed but little in the last year, and no further extension of the work downstream seems likely to be needed in the near future.

The amount expended from July 1, 1910, to June 30, 1911, is $86.35, distributed as follows: Surveys, $86.35.

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $2.91, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season, and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $5.30.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
Mar. 3, 1899 (sundry civil)	July 5, 1899	$10,000
Do	Mar. 26, 1900	10,000
June 13, 1902 (river and harbor)	July 12, 1902	10,000
Mar. 3, 1903 (sundry civil)	July 21, 1903	5,000
Apr. 28, 1904 (sundry civil)	Apr. 1, 1904	3,000
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	2,000
June 30, 1906 (sundry civil)	June 28, 1906	3,000
Do	Sept. 10, 1906	15,000
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907	3,000
May 27, 1908 (sundry civil)	May 4, 1908	2,000
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	5,000
Total		68,000

5. KEMPE BEND REVETMENT.

For history of this work, project, and details of its execution, see current summary and annual reports of the Mississippi River Commission since 1900.

At date of last annual report the total length of revetment was 13,251 feet in two detached pieces, upper 11,146 feet long, lower 2,105, with an unprotected gap of about 10,000 feet between. Along the upper revetment the upper bank had been paved to different heights for 6,500 feet, and along the lower revetment for 2,040 feet.

The work proposed during the past season was to extend existing revetment, and to make general repairs where necessary.

The survey completed in August, 1910, showed no material change in the conditions along the revetments since the previous survey in 1909, except at the upper end of the upper revetment where some scour had taken place outside the mattresses.

Caving had still continued at a rapid rate in the unprotected gap between the two revetments, and some recession of the bank had taken place below the lower work. Before commencing operations in the bend active caving commenced above the upper work which endangered the levee at that point.

Operations were commenced in Kempe Bend on October 27, 1910, and continued without interruption until January 3, 1911, when all work contemplated had been completed.

Constructing mats.—The mats for Kempe Bend were constructed on Newtown, Racehorse, and Warrenton Bars. A total of 882,300 square feet of mattress was required for this work, valued at $28,919.16. For further details of construction, see Giles Bend, and harbors of Natchez and Vidalia.

Towing mats.—The mats had to be towed about 50 miles, and the cost was:

Tug *Tunica*, 6 days at $29	$174.00
Tug *Marengo*, 30 days at $26	780.00
Steamer *Tensas*, 15 days at $24	360.00
Total	1,314.00
Total square feet towed	882,300
Cost per square foot	$0.001489

Sinking mats.—It required 180,000 square feet to extend the upper revetment upstream 900 linear feet and 702.300 square feet to mattress the 2.373 feet of bank at the lower end of the bend. The following is the detailed cost of this part of the work:

Steamers and tugs	$1,510.57
Lumber, wire, nails, etc	287.45
5,198 tons of rock at $1.93	10,032.14
761 tons of rock at $2.377	1,808.90
Miscellaneous	66.96
Provisions	1,755.57
Pay rolls	6,408.41
Total	21,870.00
Total square feet sunk	882,300
Cost per square foot to sink	$0.02479
Total cost per square foot in place	$0.05906

Grading bank.—The grading was done by grader *No. 1*, the bank being dressed also by hand where necessary. The material was mostly stiff clay on top, with layer of sand at bottom. Two thousand five hundred linear feet of bank were graded at the lower end of the bend. The following is the detailed cost:

Hydraulic grader *No. 1:*	
Steamers and tugs	$450.00
Coal	821.10
Miscellaneous	80.65
Provisions	772.75
Pay rolls	2,495.98
Hand grading (labor and provisions)	627.53
Total	5,248.01
Linear feet of bank graded	2,500
Cost per linear foot to grade	$2.099

Paving bank.—A total of 92,606 square feet or 1,416 linear feet was paved with rock as an extension to the lower upper bank revetment to a 22-foot stage on the Vicksburg gauge. The following is the detailed cost of the work:

Steamers and tugs	$687.00
2,454 tons of rock at $1.93	4,736.22
405 tons of rock at $2.377	962.69
Miscellaneous	40.00
Provisions	420.00
Pay rolls	1,871.60
Total	8,717.51
Total square feet paved	92,606
Cost per square foot	$0.09413

Repairs to pavement.—Repairs were made to upper bank work between sections 1 and 18. A total of 9,437 square feet was repaired, the detailed cost being as follows:

Steamers and tugs	$54.00
Miscellaneous	76.00
Provisions	32.74
Pay rolls	476.18
Total	638.92

Unloading rock.—There were towed to and unloaded on the bank in Giles Bend for future use on this work, 5,576 tons of rock. The following is the cost of towing and unloading:

Steamers and tugs	$636.00
Provisions	288.42
Pay rolls	1,048.30
Total	1,972.72

Clearing.—The timber along the river bank between the upper and lower revetment for 9,000 feet was felled about 300 feet back from the river bank to prevent obstructing future work, at a total cost of $891.36.

Installation.—All the plant belonging to the up river works had to be towed from New Orleans to Giles Bend, 277 miles. The cost of this towing and incidental expenses incurred before commencing operations have been charged, as usual, under the head of installation. The total cost of this item amounts to $4,838.62, of which $2,226.50 has been charged against Kempe Bend.

Rock.—The rock used on this work was delivered by contract at Vicksburg. The cost of the rock delivered on barges at Vicksburg varied from $1.93 to $2.377 per ton.

Costs.—The total cost of the work in Kempe Bend from May 1, 1910, to May 1, 1911, was $86,489.11, distributed as follows:

Constructing mats	$28,919.16
Towing mats	1,314.00
Sinking mats	21,870.00
Grading bank	5,248.01
Paving bank	8,717.51
Repairing pavement	638.92
Unloading rock	1,972.72
Clearing	891.36
Installation	2,226.50
Surveys	655.42
Steamer *Newton*	960.00
Care of plant	481.89
Repairs to plant	131.42
New plant	10,634.74
Office and administration	1,827.46
Total	86,489.11

At the close of the season's work there was on hand material for future construction valued at $7,104.38. The field cost of repairs and maintenance of the revetment was $638.92 and the improvement $71,814.68.

Summary.—As a result of the season's work the upper revetment was extended upstream 900 feet and the lower revetment downstream 2,373 feet. The upper bank of the lower extension was graded and 1,430 linear feet paved to a 22-foot stage. The timber along the bank between the revetments was cut 300 feet back for a length of 9,000 feet to prevent caving off and obstructing future work. The subaqueous revetment in Kempe Bend now has a total length of 16,524 feet in two pieces, upper 12,046 feet and lower 4,478 feet, separated by an unprotected gap of about 10,000 feet measured parallel to the general direction of the shore line. The upper bank of the upper revetment has been paved to different heights for 6,500 linear feet and the lower revetment for 3,470 linear feet. So far as is known the revetment is in good condition.

The field work was in charge of Assistant Engineer E. B. Geddes, assisted by Junior Engineer George C. Schoenberger, Supt. J. R. Allen, and Surveyor P. H. Long.

The amount expended from June 30, 1910, to June 30, 1911, is $102,789.31, distributed as follows:

Office expenses (main office)		$1,750.22
Other administrative expenses		1,021.47
Construction (hired labor):		
Materials	$44,135.60	
Wages	31,561.45	
Subsistence	11,204.86	
		86,901.91
Surveys		655.42
Repairs to plant		179.49
Care of plant		481.89
New plant		10,753.91
Miscellaneous		85.00
Steamer *Newton*		960.00
Total		102,789.31

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $4,777.91 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $6,717.35.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
Mar. 3, 1899 (sundry civil)	Mar. 13, 1900	$180,000.00
June 6, 1900 (sundry civil)	July 14, 1900	150,000.00
June 13, 1902 (river and harbor)	July 12, 1902	60,000.00
Mar. 3, 1903 (sundry civil)	July 21, 1903	64,000.00
Do	(1)	30,000.00
Apr. 28, 1904 (sundry civil)	Apr. 1, 1904	80,000.00
Mar. 3, 1905 (river and harbor)	Apr. 26, 1905	90,000.00
June 30, 1906 (sundry civil)	June 28, 1906	50,000.00
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907	12,000.00
May 27, 1908 (sundry civil)	(1)	25,000.00
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	65,000.00
June 25, 1910 (sundry civil)	Apr. 30, 1910	90,000.00
Total		896,000.00

[1] Allotted by transfer.

6. HARBORS OF NATCHEZ AND VIDALIA.

For history of this work, project and details of its execution, see current summary and previous annual reports of the Mississippi River Commission.

The harbors at Natchez and Vidalia include improvement works in Giles Bend and along Natchez front.

At the date of the last annual report the condition of the works was as follows:

The total length of the revetment complete and incomplete in Giles Bend was 21,848 feet in two detached pieces—upper 8,592 feet, and lower 13,256 feet. The total length of paved bank was about 11,000 linear feet, leaving 10,848 linear feet unpaved, mostly along the upper work. The gap of unprotected bank between the two pieces of revetment was about 1,606 feet measured parallel to the general direction of the shore line. Extensive breaks had occurred in the lower revetment, only part of which had been repaired. These breaks continued to lengthen as the river fell and additional caves occurred. By the time that it was practicable to commence work the total length which had to be mattressed and the upper bank graded and paved was about 3,500 linear feet.

The work proposed during the past season was to repair the revetment, including grading and paving of upper bank, and to close the unprotected gap of 1,606 feet between the upper and lower revetments.

Operations in the bend were begun on July 11, 1910, when grader *No. 1* commenced grading the bank near section 23. The sinking of mattresses and paving the upper bank was commenced August 10, 1910, and continued until October 27, 1910, when all the plant was moved to Kempe Bend. The plant was returned to Giles Bend January 3, 1911, and the sinking of connecting mats and paving of the upper bank continued until February 28, on which date all work was suspended for the season.

Constructing mats.—The mats used in Giles Bend and Kempe Bend this season were of the framed type and constructed on Big Black Island, Newtown, Racehorse, and Warrenton bars. The construction of mats for Giles Bend was commenced on Big Black Island on July 14, 1910. Operations were continued on this and other bars without interruption until December 31, 1910, when all the mats required for these works were completed.

Mats were constructed for Kempe Bend and Giles Bend as follows:

	Square feet.
Giles Bend	1,586,975
Kempe Bend	882,300
Total	2,469,275

The following is the detailed cost of constructing the 2,469,275 square feet:

Steamers and tugs	$2,909.00
39,000 feet b. m. miscellaneous lumber	400.00
843,134 feet b. m. 2 by 4 inch lumber	11,370.94
358,427 feet b. m. 3 by 6 inch lumber	4,744.87
27,200 pounds 9-inch steel wire nails	589.00
82,000 pounds 6-inch steel wire nails	1,625.82
12,000 pounds 4-inch steel wire nails	239.00
7,900 pounds No. 12 galvanized wire	117.22
237,000 wooden treenails	628.62
577.42 acres willow brush	1,154.84
Miscellaneous	371.46

Teams	$15,946.30
Provisions	8,401.56
Pay rolls	32,436.83
Total	80,935.46
Total square feet built	2,469,275
Cost per square foot	$0.032777

Of this total, 1,586,975 square feet was used at Giles Bend, valued at $52,016.30.

Towing mats.—The mats were towed from Big Black Island and Newtown bar, about 65 miles, and the cost was as follows:

Tug *Tunica*, 15 days, at $29	$435.00
Tug *Marengo*, 47 days, at $26	1,222.00
Steamer *Tensas*, 24 days, at $24	576.00
Total	2,233.00
Square feet of mats towed	1,586,975
Cost per square foot	$0.001407

Sinking mats.—It required 247,425 square feet of mattress to connect the channel mats with the shore between stations 131 to 153 and 212 to 224; 473,020 square feet to close the gap between the upper and lower revetment, and 866,530 square feet to mattress the breaks in the lower revetment. The following is the detailed cost:

Steamers and tugs	$2,261.00
Lumber, wire, nails, etc	473.20
9,795 tons of rock, at $1.93	18,904.35
143 tons of rock, at $2.75	393.25
Miscellaneous	187.82
Provisions	2,068.95
Pay rolls	9,175.73
Total	33,464.30
Total square feet of mattress sunk	1,586,975
Cost per square foot to sink	$0.021087
Total cost per square foot in place	$0.05527

Grading bank.—A total of 793,363 square feet of bank, or 9,297 linear feet of bank, was graded by hydraulic grader *No. 1* between stations 131 to 167 and 198 to 246, and in addition 558,300 square feet of the above dressed, and 278,910 square feet completely graded by hand. The cost was as follows:

Steamers and tugs	$900.00
Coal	1,086.12
Miscellaneous	482.61
Provisions	1,702.69
Pay rolls	3,293.69
Hand grading (labor and provisions)	3,055.43
Total	10,520.54
Linear feet of bank graded	9,297
Cost per linear foot	$1.13

Paving bank.—The bank was paved with rock and on some exposed points a layer of spalls was used underneath the rock to prevent washing. In addition to paving 6,480 linear feet of bank between stations 131 to 167 and 212 to 238, 1,734 linear feet of bank was paved near sections 19 and 23 and between 238 and 246, where caving had destroyed the upper bank work. The following is the detailed cost of this work:

Steamers and tugs	$3,498.00
11,061 tons of rock, at $1.93	21,347.73
2,701 tons of rock, at $2.377	6,420.28
7,483 tons of rock, at $2.33	17,435.39
104 tons of rock, at $2.75	286.00
Miscellaneous	127.00
Provisions	$1,167.47
Pay rolls	8,797.95
Total	59,079.82
Total square feet paved	766.650
Cost per square foot	$0.07706

Repairing pavement.—Miscellaneous repairs were made to the pavement at spurs 6, 7, 8, and 9, and between stations 168 to 198 and 246 to 263, covering about 3,500 linear feet, or 55,300 square feet of bank. The following is the detailed cost:

Steamers and tugs	$280.00
423 tons of rock, at $2.75	1,163.25
378 tons of rock, at $1.93	729.54
Miscellaneous	40.00
Provisions	300.00
Pay rolls	907.98
Total	3,420.77

Clearing.—The timber along the river bank was cut between stations 131 to 167 and 198 to 246 and logs and trees removed, at a total cost of $167.14.

Drainage.—A ditch was cut at section 23 to drain borrow pits, at a cost of $67.62.

Clearing Cowpen Point levee.—About 9,500 linear feet was cleared of brush and weeds at a cost of $145.85.

Installation.—At the close of the season's work in 1909–10 the plant belonging to this and the other up-river works had been laid up at the engineer depot, New Orleans, and had to be towed back to Giles Bend. The first tow arrived in Giles Bend on June 14, 1910, and by July 8, 1910, all the plant had been accumulated in Giles Bend. The cost of towing and incidental expenses incurred before commencing operations was $4,838.62, of which $2,612.12 has been charged against Giles Bend.

Rock.—The rock required for this revetment was purchased under contract and delivered at Vidalia, La., and Vicksburg, Miss. Its cost loaded on barges was from $1.93 to $2.377 per ton of 2,000 pounds.

Costs.—The total cost of the work in Giles Bend from May 1, 1910, to May 1, 1911, was $175,759.44, distributed as follows:

Constructing mats	$52,016.30
Towing mats	2,233.00
Sinking mats	33,464.30
Grading bank	10,520.54
Paving bank	59,079.82
Repairs to pavement	3,420.77
Clearing	167.14
Drainage	67.62
Repairing levee	145.85
Installation	2,612.12
Surveys	2,286.15
Miscellaneous and *Newton*	2,249.50
Care of plant	1,039.46
Repairs to plant	252.02
New plant	650.19
Office and administration	5,554.66
Total	175,759.44

The field cost of repairs and maintenance of the revetment was $75,131.94 and the improvements $90,881.67. At the close of the season's work no material was on hand for this work.

Summary.—As a result of the season's work in Giles Bend connecting mats were placed and the upper bank graded and paved between stations 131 and 153, covering 2,306 linear feet of bank; the gap between the upper and lower revetments was mattressed 300 feet wide, and the upper bank graded and paved to a 35-foot stage for 1,606 linear feet: the two pockets where caving had occurred between stations 198 and 212 were mattressed and the upper bank graded for 1,305 linear feet, and the points at the upper and lower ends paved for 557 linear feet; connecting mats were placed and the upper bank graded and paved to a 30-foot stage between stations 212 and 224, covering 1,255 linear feet; the upper bank between stations 224 and 228 was graded and paved for 300 linear feet; the break in the revetment between stations 228 and 246 was mattressed from 250 to 300 feet wide, and the upper bank graded and paved to a 35-foot stage for 2,190 linear feet, and miscellaneous repairs were made to the pavement at spurs 6, 7, 8, and 9, and between stations 168 to 198 and 246 to 263, covering about 3,500 linear feet of bank. Altogether a total of 1,586,975 square feet of mattress and 766,650 square feet of new pavement was required for the work completed in Giles Bend the past season. The subaqueous revetment in Giles Bend now has a total length of 23,454 feet measured parallel to the general direction of the shore line, and the total length of effective upper bank pavement is about 17,000 feet.

Natchez front.—A careful hydrographic survey was completed along the Natchez front in September, 1910, to determine the changes, if any, taking place. Since the revetment was placed in 1907 there has been practically no change in the bank line below the low-water contour, except immediately above the upper revetment, where there has been considerable recession in the last year for about 500 feet.

No work was done along this front in the past year, and the total length of revetment still remains 2,550 feet in two pieces, the upper being 1,150 feet long and the lower 1,400 feet long, separated by about 2,000 feet.

The field work was in charge of Assistant Engineer E. B. Geddes, assisted by Junior Engineer Geo. C. Schoenberger, Supt. J. R. Allen, and Surveyor P. H. Long.

The amount expended from June 30, 1910, to June 30, 1911, is $170,588.22, distributed as follows:

Office expenses (main office)		$3,598.69
Other administrative expenses		2,603.98
Construction (hired labor):		
Materials	$80,412.45	
Wages	61,276.80	
Subsistence	15,275.18	
		156,964.43
Surveys		2,719.97
Repairs to plant		252.02
Care of plant		1,521.12
New plant		678.51
Miscellaneous		349.50
Steamer *Newton*		1,900.00
Total		170,588.22

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $9,960.50, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $10,606.34.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
Harbors of Natchez and Vidalia:		
June 16, 1880 (sundry civil)		$40,000.00
Mar. 3, 1881 (river and harbor)		50,000.00
July 13, 1892 (river and harbor)		80,000.00
Aug. 18, 1894 (sundry civil)		80,000.00
June 3, 1896 (river and harbor)	June 27, 1896	64,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	50,000.00
June 13, 1902 (river and harbor)	July 12, 1902	60,000.00
Mar. 3, 1903 (sundry civil)	July 21, 1903	12,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	40,000.00
June 30, 1906 (sundry civil)	June 28, 1906	50,000.00
Mar. 2, 1907 (river and harbor), for Giles Bend, $75,000; for Natchez front, [1] $90,000	July 12, 1907	165,000.00
May 27, 1908 (sundry civil), for Giles Bend	May 4, 1907	75,000.00
Received from sales blue prints		2.10
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	50,000.00
June 25, 1910 (sundry civil)	Apr. 30, 1910	44,000.00
June 25, 1910 (river and harbor)	July 6, 1910	130,000.00
		990,002.10
Prevention of cut-off at Giles Bend, La.:		
June 4, 1897 (sundry civil)	July 10, 1897	[2] 110,000.00
June 6, 1900 (sundry civil)	July 14, 1900	150,000.00
		260,000.00
Emergencies in river and harbor works (allotment for "Mississippi River at Giles Bend"):		
Apr. 28, 1904 (sundry civil)	July 6, 1904	40,000.00
Grand total		1,290,002.10

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[1] Original allotment, $100,000; $10,000 transferred to Atchafalaya and Red Rivers, La.

[2] Original allotment, $150,000; $40,000 transferred to harbor at New Orleans, La.

7. IMPROVING ATCHAFALAYA AND RED RIVERS, LA.

For history of this work, project, and details of its execution, see current summary and previous reports of the Mississippi River Commission.

The work contemplated for the past season was to repair and maintain the dredge *The Ram*, and to do such dredging as might be necessary to maintain low-water navigation between the Mississippi, Red, and Atchafalaya rivers through lower Old River.

On August 8, 1910, *The Ram* commenced dredging a channel over the bar at the entrance to Old River, with the Red River Landing gauge reading 22.4. Dredging was continued until October 5, 1910. A channel 5 feet below the zero of the gauge and 150 feet wide was made. Navigation has remained free and unobstructed, although the river declined to 3.8 feet on the gauge at Red River Landing.

The current in Old River has flowed from the Mississippi toward the Atchafalaya during the year.

The annual surveys of Old River and vicinity were made directly by the commission, and for this reason the usual table showing changes in Old River and in the vicinity of the sill dams in the Atchafalaya are omitted.

The work was under the direction of Assistant Engineer H. S. Douglas.

The amount expended from June 30, 1910, to June 30, 1911, is $10,593.14, distributed as follows:

Office expenses (main office)		$656.32
Other administrative expenses		325.05
Dredging Old River:		
Materials	$1,771.21	
Wages	2,975.04	
Subsistence	1,384.72	
		6,130.97
Surveys		328.75
Repairs to plant		2,710.88
Care of plant		25.71
New plant		352.33
Steamer *Newton*		63.13
Total		10,593.14

In compliance with resolution of the commission, adopted April 9, 1906, there should be added to the above total cost for the year $1,449.08, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
Mouth of Red River, La.:		
June 18, 1878 (river and harbor)		$150,000.00
Mar. 3, 1879 (sundry civil)		40,000.00
July 5, 1884 (river and harbor)	Aug. 5, 1884	[2] 11,390.00
Do	(1)	10,500.00
Do	(1)	1,400.00
Do	Aug. 19, 1884	15,000.00
		228,290.00
Rectification of Red and Atchafalaya Rivers:		
Aug. 5, 1886 (river and harbor)		187,500.00
Aug. 11, 1888 (river and harbor)		250,000.00
Sept. 19, 1890 (river and harbor)	Oct. 15, 1890	[3] 217,000.00
Do	(1)	3,000.00
July 13, 1892 (river and harbor)		80,000.00
Aug. 18, 1894 (sundry civil)		[4] 70,000.00
June 3, 1896 (river and harbor)	June 27, 1896	40,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	25,000.00
June 13, 1902 (river and harbor)	July 12, 1902	15,000.00
Do	Oct. 17, 1904	1,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	24,000.00
Settlement by Navy Department, Feb. 6, 1907		8,866.42
May 27, 1908 (sundry civil)	Nov. 3, 1908	(5)

[1] By transfer.

[2] Original allotment, $12,290; $900 transferred to harbor at New Orleans.

[3] Original allotment, $225,000; $8,000 transferred to harbor at New Orleans.

[4] $2,500 expended improving Bayou des Glaises.

[5] Original allotment, $1,500; transferred to plant, fourth district.

Abstract of appropriations—Continued.

Act of Congress.	Allotted.	Amount.
Rectification of Red and Atchafalaya Rivers—Continued.		
May 27, 1908 (sundry civil)	(1)	$10,000.00
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	25,000.00
June 25, 1910 (sundry civil)	Apr. 30, 1910	25,000.00
		981,166.42
Emergencies in river and harbor works ("Old River"):		
Mar. 3, 1905 (river and harbor)	Oct. 5, 1908	6,000.00
Do	Nov. 12, 1908	4,000.00
		10,000.00
Grand total		1,219,456.42

[1] By transfer.

8. NEW ORLEANS HARBOR.

For history of this work, project, and details of its execution, see current summary and previous annual reports of the Mississippi River Commission.

For general map showing location of works of improvement in New Orleans Harbor, see Plate V, annual report for 1905, opposite page 280.

At the date of the last report the aggregate length of bank protected in whole or in part was 35,715 linear feet, all of the work being in good condition as far as was known.

The work projected for the past season was to place revetment along the Gretna Front, beginning at Newton Street and extending downstream as far as might be found necessary during the progress of the work, and to continue the revetment in the Carrollton Bend as far as funds will permit. This project was amended later to provide for about 1,100 feet of revetment in the third district reach from Spain to St. Ferdinand Street. where the subsiding bank had destroyed a wharf.

Operations were commenced on November 12, 1910, and all work was completed on March 23, 1911.

Mattress construction.—Two mattress-construction plants were operated, one from November 14, 1910, to February 17, 1911, building 1,345,000 square feet, and the other from January 1 to February 16, 1911, building 615,000 square feet. A total of 1,960,000 square feet of mattress was built, the detail of the field cost being as follows:

265,204 feet b. m. 3 by 6 inch lumber	$3,702.40
670,349 feet b. m. 2 by 4 inch lumber	9,048.09
16,000 feet b. m. miscellaneous lumber	382.00
22,100 pounds 9-inch steel-wire nails	472.42
61,700 pounds 6-inch steel-wire nails	1,240.36
7,600 pounds 4-inch steel-wire nails	224.16
8,700 pounds No. 10 galvanized wire	220.95
30,500 9-inch treenails	72.89
145,000 6-inch treenails	295.80
20,000 cords brush	20,676.07
Steamers and tugs	4,259.50
Miscellaneous	176.83
Provisions	5,443.09
Pay rolls, services	21,759.25
Total	67,973.81
Cost per square foot for construction of mattress	$0.0347

Brush.—The item of 20,000 cords of brush given in the foregoing table is analyzed as follows:

Cutting and piling, building roads, etc	$11,273.69
Transportation to ways	8,467.68
Privilege of cutting brush	934.70
Total	20,676.07
Cost per cord delivered at ways	$1.0338

Ways.—Six sets of ways were built and their cost is included in mattress construction. Of the six sets the cost of only four was kept in detail, as follows:

Lumber and nails	$610.00
Labor and superintendence	380.75
Total	990.75
Average cost of four sets, each	247.69

Towing.—As has been customary, the expense of towing lumber and other materials for mattress construction has been added to and is included in the cost of such materials delivered at the site of the work. The cost of towing mattresses from the places where they were built to New Orleans is given below. A total of 1,960,000 square feet of mattress was towed, of which 505,500 was from Halpino bar, 390 miles, 315,000 from Warrenton bar, 360 miles, 300,000 from Kempe Island, 315 miles, and 839,500 from Palmetto bar, 237 miles. The cost was as follows:

Steamer *Ramos*, single crew, 11 days, at $34.50	$379.50
Steamer *Ramos*, double crew, 43 days, at $58	2,494.00
Steamer *Plaquemine*, double crew, 68 days, at $65	4,420.00
Tug *Morganza*, single crew, 15 days, at $30.50	457.50
Total	7,751.00
Average cost per square foot for towing	$0.00395

Sinking.—With the exception of some slight embarrassment caused by the high stage of the river at which some of the mattresses were sunk, work proceeded in a routine manner. The first mattress was successfully sunk on December 31, 1910, and the last on March 23, 1911. Detail cost was as follows:

13,644.02 tons rock	$27,593.6
Lumber, wire, wire nails, etc	917.66
Steamers and tugs	3,473.50
Miscellaneous	153.35
Provisions	3,500.43
Pay rolls, services	9,153.6
Total	44,792.2
Cost per square foot to sink	$0.0228

Summarizing the field cost of construction, towing, and sinking of mattresses, we have:

Construction of mattress, per square foot	$0.03470
Towing of mattress, per square foot	.00395
Sinking of mattress, per square foot	.02285
Total field cost per square foot in place	.06150

Rock.—Proposals for furnishing 13,000 tons of rock were opened November 5, 1910, and contract awarded for delivery on railroad cars in New Orleans at $1.90 per ton of 2,000 pounds. The cost of transferring from cars to barges was 25 cents per ton, making a total of $2.15. Under the contract there was delivered 10,139.65 tons, of which 6,727.90 tons was used during the past season. In addition, rock was purchased in open market delivered on barges as follows: 4,576.09 tons, at $1.75, and 2,511.49 tons, at $1.50. A small amount, 627.56 tons, was loaded from the reserve supply on the bank. In all, 13,644.02 tons of rock was used during the past season, leaving on hand from this and previous seasons 8,459.47 tons.

Installation.—As the plant was in the field about 400 miles distant from New Orleans, incident to work at Reid-Bedford and Albemarle Bends, it had to be towed back. This, with other expenses preparatory to commencing actual construction, amounted to $2,141.

Surveys.—The usual annual surveys of the Carrollton, Greenville, and Gouldsboro Bends, and of the Gretna front and third district reach have been made. In the Carrollton Bend, comparing the surveys of 1906 and 1910, a marked scour of the unprotected bank above section 5 is shown. Over the protected bank from section 5 to section 24, changes are slight and unimportant. From section 24 to section 34 the zero contour shows a decided recession, but this may be attributed to dredging material for the recent enlargement of the levee. Below section 34 there has been practically no change. In the Greenville Bend, comparing the surveys of 1906 and 1910, extensive changes are shown. From the company's canal to Harveys Canal, with the exception of the protected bank at Amesville, scour has been almost universal and of proportions heretofore unknown in this part of the river. At section 1 the zero contour has receded 290 feet; at section 2, 148 feet; at section 20, 100 feet, and elsewhere recessions of 30 to 60 feet are frequent. On the Gretna front, comparing the surveys of 1906 and 1910, no marked changes are noted. In the Gouldsboro Bend, comparing the surveys of 1905 and 1910, a general disposition to scour between the spurs is shown, this being especially apparent between spurs Nos. 5½, 6, and 7. In the third district reach, comparing the surveys of 1906 and 1911, changes are slight and in the direction of fill rather than of scour. The usual survey work incident to placing and locating mattresses in revetment was done by the constructing force. The cost of survey work charged to New Orleans Harbor was $275.

Summary.—A total of 7,850 linear feet of revetment was constructed, of which 2,765 linear feet on the Gretna front was 300 feet wide; 3,975 feet in the Carrollton Bend was 200 feet wide; and 675 and 435 feet in the third district reach, respectively, 300 and 200 feet wide. This work involved the placing of 1,960,000 square feet of mattress, and the detailed cost of it is as follows:

Construction of mattress, including cost of ways	$67,973.81
Towing of mattresses	7,751.00
Sinking of mattresses	44,792.28
Installation	2,141.00
Surveys	275.00
Rock, lumber, etc., on hand for future construction	20,419.89
Repairs to plant	288.17
Care of plant	680.78
New plant	2,649.38
Office and administrative expenses	5,680.17
Total	152,651.48
Deduct value of material on hand for future work	20,419.89
Gross cost of season's work	132,231.59
Deduct repairs and care of plant, new plant and office, and administrative expenses	9,298.50
Net field cost of season's work	122,933.09

Gross cost per square foot for mattress in place in revetment	$0.0675
Gross cost per linear foot for revetment 200 feet wide	13.55
Gross cost per linear foot for revetment 300 feet wide	21.09
Net field cost per square foot for mattress in place in revetment	.0627
Net field cost per linear foot for revetment 200 feet wide	12.58
Net field cost per linear foot for revetment 300 feet wide	19.74

(NOTE.—Such rock, lumber, etc., as was on hand at the close of the last season, and used this year, is charged in the construction and sinking of mattresses.)

Nothing was expended on account of repair and maintenance of existing revetment during the year.

The revetment in the Carrollton Bend now has a length of 13,330 linear feet and consists of 3,975 feet of continuous mattress 400 feet wide, 3,955 feet of continuous mattress 300 feet wide, 3,365 feet of continuous mattress 250 feet wide, placed generally with its inshore edge along the 60-foot contour, and 2,035 feet protected with 5 submerged sloping spur dikes in conjunction with continuous mattress. In the Greenville Bend there is now 1,570 linear feet of continuous mattress 300 feet wide. On the Gretna front 2,795 linear feet of continuous mattress 300 feet wide. In the Gouldsboro Bend 9,475 linear feet protected by 24 submerged sloping spur dikes. In the third district reach 9,400 linear feet of continuous mattress from 300 to 400 feet wide, in conjunction with 16 submerged sloping spur dikes and 1,110 linear feet of continuous mattress from 200 to 300 feet wide. The total length of bank protected wholly or in part is 37,680 linear feet, about 7¼ miles. The 1,940 feet nominally protected by two spur dikes placed in the Greenville Bend in 1889 and 1890 is omitted from the total, since these dikes, although apparently intact, have been flanked, and the caving is continuing back of them. Two of the mattresses sunk in the Carrollton Bend to prolong the work of previous years from the 60-foot contour up to low-water line have slipped down the hard-clay bank, which has an inclination of 1 in 2. A survey indicated that no caving of the bank had occurred in the vicinity. With the exceptions noted, all of the work, so far as is known, is in good condition.

The field work was in charge of Assistant Engineer H. S. Douglas, assisted by Junior Engineers G. D. Waddill, T. M. McCarroll, and J. H. Lewis.

The amount expended from June 30, 1910, to June 30, 1911, is $147,488.92, distributed as follows:

Office expenses (main office)		$2,581.11
Other administrative expenses		3,315.06
Construction (hired labor):		
Materials	$58,185.77	
Wages	62,078.72	
Subsistence	14,758.75	
		135,023.24
Surveys		275.00
Repairs to plant		340.51
Care of plant		1,013.57
New plant		2,729.06
Steamer *Newton*		1,348.58
Constructing barges, third district		862.79
Total		147,488.92

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $7,918.52, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season, and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $9,336.76.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
Improving harbor at New Orleans, La.:		
June 18, 1878 (river and harbor)		$50,000.00
March 3, 1879 (sundry civil)		60,000.00
June 16, 1880 (sundry civil)		75,000.00
Mar. 3, 1881 (river and harbor)		75,000.00
Aug. 2, 1882 (river and harbor)	(1)	162.96
Jan. 19, 1884 (river and harbor)	(1)	1,400.00
July 5, 1884 (river and harbor)	(1)	4,900.00
July 13, 1892 (river and harbor)		80,000.00
Aug. 18, 1894 (sundry civil)		110,000.00
June 3, 1896 (river and harbor)	June 27, 1896	110,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	110,000.00
Received from sale of property		38.63
		676,501.59
Improving Mississippi River, New Orleans Harbor:		
Aug. 5, 1886 (river and harbor)		75,000.00
Aug. 11, 1888 (river and harbor)		[2] 199,888.00
Sept. 19, 1890 (river and harbor)	Oct. 15, 1890	90,000.00
Do	Dec. 4, 1890	10,000.00
Do	(1)	8,000.00
June 4, 1897 (river and harbor)	(1)	10,000.00
Do	(1)	40,000.00
June 13, 1902 (river and harbor)	July 12, 1902	95,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	85,000.00
June 30, 1906 (sundry civil)	June 28, 1906	10,000.00
Mar. 2, 1907 (river and harbor)	July 12, 1907	100,000.00
May 27, 1908 (sundry civil)	May 4, 1908	150,000.00
Received from sales, blue prints		1.75
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	100,000.00
June 25, 1910 (river and harbor)	July 25, 1910	175,000.00
		1,147,889.75
Grand total		1,824,391.34

[1] By transfer.
[2] Original appropriation, $200,000. $112 reserved by the Chief of Engineers for office expenses.

9. PLANT.

At date of last annual report the working plant of the district consisted of 72 large pieces. On July 24, 1910, the new steel-hull towboat *Plaquemine* was delivered at New Orleans by the contractor, and shortly thereafter was accepted and placed in commission. This boat has been operated continuously during the season, without loss of time due to accident or breakdown. Under projects approved May 31, 1910, and August 8, 1910, the construction of the following additional plant was authorized: Two steel-hull towboats, the *Teche* and the *Lafourche*, two steel barges, one hydraulic grader, one derrick boat, two quarter boats, and eight standard barges of creosoted lumber. The construction of a galvanized-iron temporary warehouse at the engineer depot was also authorized. All of this additional plant, except one of the steel-hull towboats, the *Lafourche*, the two steel barges, and the warehouse, have been completed. In addition a new quarter boat to replace the old *Lake Borgne* was built. The old quarter boats *Beta*, *Delta*, *Lake Borgne*, together with barges *No. 15C*, *No. 31C*, and *No. 32C*, have been condemned. The working plant now comprises 81 large pieces, exclusive of docks, lighters, pontoons, skiffs, etc. The new plant, except the steel-hull towboats and steel barges, has been constructed, and existing plant repaired, cared for, and maintained at the United States engineer depot, at New Orleans, La., and at Giles Bend, Miss. Details of operations on the construction of new plant and the repairs and care of that on hand are as follows:

Construction.—After due advertisement, proposals were opened June 24, 1910, and contract awarded to Mr. Ed. J. Howard, of Jeffersonville, Ind., for the construction of the steel hull steamer *Teche*. This boat has been completed and arrived at New Orleans, April 19, 1911. Proposals for the construction of the steamer *Lafourche* were opened July 28, 1910, and contract awarded to the Johnson Iron Works, of New Orleans. Construction of the boat is now in progress. Proposals for the construction of the two steel barges were opened January 26, 1911, and contract awarded to the Des Moines Bridge & Iron Co., of Pittsburgh, Pa. Construction of the new hydraulic grader *No. 2*, derrick boat *No. 2*, quarter boats *Bayou Sara*, *Bayou Goula*, *Lake Borgne*, and eight new barges by hired labor was commenced during July and all of them completed during the year. In addition to the foregoing the following plant was constructed for other engineer districts. Six standard barges for the first and second Mississippi River districts, three barges and a pile-driver hull for works in charge of Lieut. Col. Lansing H. Beach. The construction of a temporary warehouse, deferred until the river reached a stage that would permit the driving of the necessary pile foundation with a floating driver, has been commenced and is well advanced.

Repairs.—Repairs to the plant of the district have been made at the Engineer Depot, New Orleans, La., and at Giles Bend, Miss., details being as follows:

Designation.	Cost.	Work done.
Steamers:		
Gen. John Newton	$1,248.70	New derrick boom, stack knees, bitts, and wheel rebuilt; painted throughout; usual maintenance.
Plaquemine	434.01	Minor alterations to improve efficiency.
Tensas	432.41	New ash pan, 3 new wheel flanges, new wheel; usual maintenance.
Tugs:		
Tunica	577.98	New breeching, new iron bitts; roof repaired; boat painted; usual maintenance.
Marengo	614.98	95 linear feet new fender streak; deck repaired; hull painted; usual maintenance.
Manchac	531.71	6 graving pieces in hull; 18 feet new fender streak; new stern bitts; deck repaired; usual maintenance.
Dredge The Ram	2,000.60	New centrifugal main pump; old boilers condemned and dismantled; usual maintenance.
Levee machine Barataria	5,033.25	Repairs of injuries caused by machine going overboard off barge; new upper circle of track; new boxes and journals; new tubes in boiler; shaft straightened; cabin repaired; new steam and water piping and machine generally overhauled.
Grader No. 1	2,373.62	Furnace front and fire-door liners renewed; new tubes and tube heads in condensers; new valves and seats in main pumps; sheathing of deck repaired; cabin painted; usual maintenance.
Quarter boats:		
New Orleans	1,641.78	New cooking range, new plumbing and water tanks; alterations and repairs to cabin; boat painted; usual maintenance.
Natchez	498.53	Roof and cabin repaired; usual maintenance.
Baton Rouge	153.57	Cabins screened with wire mesh; minor repairs and maintenance.
St. Joseph	293.08	Do.
Derricks:		
No. 1	183.80	New truss rods on boom; new feed water heater; usual maintenance.
No. 2	128.46	New friction wheel, 2 new gear wheels, and 1 winch head.
Barges:		
No. 7	374.00	Docked; bottom, sides, and rakes calked; sheathing of deck repaired.
No. 13	732.00	Docked; bottom, sides, and rakes calked; new sheathing for deck.
No. 16-C	184.77	Rakes and sides calked; 20 new pieces rake plank; new ends on gunwales.

Designation.	Cost.	Work done.
Barges—Continued.		
No. 17–C	$212.00	Camel dock under ends, 4 graving pieces in gunwales, and 1 new rake plank; rakes and sides calked.
No. 33	146.90	Docked; 1 new bottom plank; minor repairs; bottom, sides, and rakes calked.
No. 37	265.00	Docked; graving piece in bottom gunwale, 63 feet knuckle plank, sheathing on deck repaired; bottom, sides, and rakes calked.
No. 43	216.47	Docked; new sheathing on deck, and new corner rake iron; bottom, sides, and rakes calked.
No. 44	448.30	Docked; 1 new clamp on gunwales; new sheathing on deck; bottom, sides, and rakes calked.
No. 3	106.06	Rakes and sides calked; sheathing of deck repaired; hold cleaned; minor repairs.
No. 6	41.05	Do.
No. 8	116.68	Do.
No. 9	74.00	Do.
No. 12	52.13	Do.
No. 22	153.00	Do.
No. 23	111.26	Do.
No. 24	122.70	Do.
No. 26	74.75	Do.
No. 29	51.00	Do.
No. 34	111.09	Do.
No. 35	88.74	Do.
No. 36	82.45	Do.
No. 38	80.69	Do.
No. 41	62.05	Do.
No. 42	145.22	Do.
No. 48	68.60	Do.
No. 52	51.84	Do.
Steamers:		
Ramos	246.44	Minor current repairs and maintenance.
Teche	67.95	Do.
Tug Morganza	79.56	Do.
Grader No. 2	79.00	Do.
Launch Beatrice	74.95	Do.
Quarter boats:		
Alpha	31.60	Do.
Beta	5.75	Do.
Gamma	80.80	Do.
Delta	121.02	Do.
Lake Borgne No. 1	99.28	Do.
Lake Borgne No. 2	32.96	Do.
Barges:		
No. 1	6.29	Do.
No. 2	6.30	Do.
No. 4	5.80	Do.
No. 4–C	4.80	Do.
No. 10	30.29	Do.
No. 20	6.07	Do.
No. 21	5.45	Do.
No. 25	5.55	Do.
No. 27	58.15	Do.
No. 30–C	20.35	Do.
No. 31–C	46.80	Do.
No. 39	4.19	Do.
No. 40	11.99	Do.
No. 45	52.00	Do.
No. 46	90.00	Do.
No. 47	4.80	Do.
No. 49	4.90	Do.
No. 50	5.40	Do.
No. 51	4.65	Do.
No. 54	3.20	Do.
Levee machine barge	1,287.14	This barge sunk with the levee machine; docked; 4 new gunwale pieces, 1 new timber head and 4 additional tie rods; spud frame repaired and barge decked over; bottom, sides, and rakes calked.
Skiffs	594.25	9 new skiffs built and 25 repaired.
Miscellaneous	747.86	Building stages for handling rock; repairing mattress jacks; making reels for wire cables; repairing docks, pumps, etc.
Total	22,128.63	

Of this total the sum of $8,320.99 was charged to the allotments for Atchafalaya and Red Rivers, and to levees, on account of repairs to *The Ram* and to the *Barataria*. The remainder, $13,807.64 was for the repair, care, and maintenance of the plant at large.

Care of plant.—In addition to the foregoing, the cost of caring for the plant while not in use, including such items as watching at night, putting out and taking in mooring lines, operating pump boat, salaries of one boat's crew, general supervision, etc., amounted to $6,460.

Condition of plant.—The general condition of the plant is good. The hulls of quarter boats and barges built of noncreosoted lumber have continued to deteriorate, and the quarter boats *Alpha* and *Gamma*, together with barges *No. 4-C, No. 16-C, No. 17-C, No. 18-C, No. 28-C*, and *No. 30-C*, being beyond economical repair, will be presented for condemnation.

Supt. R. H. Bolen was in charge at the engineer depot of the construction, repair, and care of plant, under the general direction of Assistant Engineer H. S. Douglas.

PLANT, FOURTH DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $207,869.65, distributed as follows:

Office expenses (main office)		$2,579.58
Other administrative expenses		857.50
Repairs (hired labor):		
Materials	$11,032.98	
Wages	8,192.91	
Subsistence	946.09	
		20,171.98
Care of plant		8,007.24
New plant		4,650.20
Steamer *Newton*		1,344.62
		37,611.12
New plant, construction of barges, etc		170,258.53
Total		207,869.65

Abstract of appropriations.

Acts of Congress.	Allotted.	Amount.
Aug. 18, 1894 (sundry civil)	Sept. 8, 1894	$10,000.00
June 4, 1897 (sundry civil)	Aug. 20, 1897	20,000.00
Transferred from Quartermaster's Department, authority Secretary of War	Sept. 21, 1898	8,000.00
July 1, 1898 (sundry civil)	Mar. 13, 1899	5,556.00
Mar. 3, 1899 (sundry civil)	do	64,444.00
June 6, 1900 (sundry civil)	July 20, 1900	25,000.00
June 13, 1902 (river and harbor)	July 12, 1902	111,000.00
Proceeds of sale of engineer property		540.81
Mar. 3, 1903 (sundry civil)	Apr. 16, 1903	22,000.00
Do	July 21, 1903	25,000.00
Proceeds of sale of engineer property		5,351.74
Do		1,018.80
Received for injuries to barge		18.00
Apr. 28, 1904 (sundry civil)	Apr. 1, 1904	38,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	45,000.00
June 30, 1906 (sundry civil)	June 28, 1906	55,000.00
Mar. 2, 1907 (river and harbor)	Apr. 6, 1907	65,000.00
Proceeds of sale of engineer property		570.95
Received from sale of blue print		.25
May 27, 1908 (sundry civil)	May 4, 1908	55,000.00
Do	(1)	1,500.00
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	106,000.00
Proceeds of sale of engineer property		258.50
Transferred from improving Bayou Vermilion and Mermentau River, La., "for Mermentau River"		29.41
Repair of damages to plant		5.25
June 25, 1910 (sundry civil)	Apr. 30, 1910	100,000.00
June 25, 1910 (river and harbor)	July 6, 1910	122,000.00
Transferred from first and second districts (barge construction)		30,000.00
Proceeds of sale of engineer property		208.55
Total		916,502.26

[1] By transfer.

10. SURVEYS, GAUGES, AND OBSERVATIONS.

During the year the annual surveys called for by resolution of the Mississippi River Commission were made at Bondurant Chute, Kempe Bend, Giles Bend, and Natchez front, and in New Orleans Harbor at Carrollton Bend, Greenville Bend, Gretna Bend, Gouldsboro Bend, Algiers Point, and third district reach. Of these surveys only those in New Orleans Harbor were charged to the regular allotment for surveys, the cost of the others being charged to the works in progress.

The amount expended from June 30, 1910, to June 30, 1911, is $4,889.03, distributed as follows:

Office expenses (main office)		$84.45
Field work and drafting:		
Materials	$578.87	
Wages	2,850.65	
Subsistence	1,021.52	
		4,451.04
Repairs to plant		68.15
Care of plant		38.47
New plant		176.92
Steamer *Newton*		70.00
Total		4,889.03

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $97.06 for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration.

Abstract of appropriations.

Acts of Congress.	Allotted.	Amount.
"Survey, unleveed front, fourth district," Aug. 2, 1882 (river and harbor)		$1,000.00
"Survey, Cubbitts Gap and vicinity," Aug. 2, 1882 (river and harbor)		[1] 137.14
"Observations at Carrollton, La.":		
Aug. 2, 1882 (river and harbor)		3,000.00
Mar. 3, 1883 (river and harbor)		1,500.00
Total		4,500.00
"Discharge observations," Aug. 11, 1888 (river and harbor)	Oct. 3, 1888	9,000.00
"Gauges," Aug. 11, 1888 (river and harbor)	do	2,000.00
"Surveys, examinations, and contingencies":		
Aug. 11, 1888 (river and harbor)	Dec. 20, 1888	1,000.00
Do	Mar. 20, 1890	3,000.00
Total		4,000.00
"Surveys, gauges, and observations":		
Sept. 19, 1890 (river and harbor)	Dec. 4, 1890	12,000.00
Do	[2]	1,000.00
July 13, 1892 (river and harbor)	Aug. 10, 1892	12,000.00
Mar. 3, 1893 (sundry civil)	May 18, 1893	12,000.00
Aug. 18, 1894 (sundry civil)	Sept. 8, 1894	12,000.00
Mar. 2, 1895 (sundry civil)	Apr. —, 1895	10,000.00
June 3, 1896 (river and harbor)	Aug. 25, 1897	500.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	5,000.00
June 6, 1900 (sundry civil)	May 27, 1899	5,000.00
Do	Nov. 28, 1900	1,000.00
June 13, 1902 (river and harbor)	July 12, 1902	5,000.00
Mar. 3, 1903 (sundry civil)	July 21, 1903	6,000.00
Apr. 28, 1904 (sundry civil)	Apr. 1, 1904	5,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	5,000.00
June 30, 1906 (sundry civil)	June 28, 1905	5,000.00
Mar. 2, 1907 (river and harbor)	July 12, 1907	5,000.00
May 27, 1908 (sundry civil)	May 4, 1908	5,000.00
Received from sales blue prints		8.26
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	3,000.00
Received from sales blue prints		3.10
June 25, 1910 (sundry civil)	Apr. 30, 1910	5,000.00
Received from sales blue prints		2.50
Total		109,513.86
Grand total		135,151.00

[1] Original allotment, $300; $162.86 transferred to New Orleans Harbor.

[2] By transfer.

11. LEVEES.

For work of levee construction and maintenance, the fourth district, improving Mississippi River, is divided into seven levee districts. For limits of the districts see current report of the Mississippi River Commission and the plates published in last annual report.

On July 6, 1910, the amount of levee work required to complete the contracts in force was 54,560 cubic yards, at an average cost of 18.88 cents per cubic yard.

Under projects approved May 31, August 4, and October 5, 1910, for the expenditure of the allotments from the rivers and harbors act approved June 25, 1910, and allotments from the sundry civil act approved April 30, 1910, together with the balances of former allotments, contracts were entered into during the year for the construction of 1,723,559.59 cubic yards of levee work, at an average cost of 15.52 cents per cubic yard.

Levee machine "Barataria."—On December 8, 1910, after having completed Junior levee, and while being transferred to the barge, the levee machine was lost in the river, due to the caving of the bank upon which the shore end of the barge was grounded. The machine was raised, brought to New Orleans, and repaired.

Surveys.—In the Homochitto district, a survey of the three basins—from Glass to Grand Gulf, from Rodney to Coles Creek, and from Fort Adams to Tunica—was made to determine the areas overflowed at high water and extent of levees required to protect these basins from overflow from the Mississippi River and what drainage should be provided. Surveys were made in the Lower Tensas, Barataria, and Lake Borgne districts to develop profiles of the top of the levee, to establish bench marks, and erect high-water gauges.

From the surveys it was discovered that there is a subsidence of the levees in the Barataria and Lake Borgne districts. On this account the table showing the condition of levees will give lower levees for these districts than the table published in 1910.

Comparing the elevation of the top of the levees with the elevation taken in previous years, it was seen that the subsidence was much greater than could be expected for ordinary shrinkage. This, with the experience in building new levees, where it was noticed that the quantities computed by measuring the borrow pits, were much greater than those in the embankment, and in one case as much as 30 per cent, proved that there was a subsidence in the base or foundation of the levee. It was also noticed that the subsidence was dependent both on the height of the levee and on the elevation of the ground upon which the levee is built. This subsidence of the foundation does not seem to take place where the land upon which the levee is built is more than 8 feet above mean Gulf level.

Repairs.—The Bougere levee, in the Lower Tensas levee district, was repaired at a cost of $5,391.80. The repairs consisted in restoring wave and rain wasted sections and enlarging the levee where it had subsided. A drainage ditch, requiring 15,049.04 cubic yards of excavation, was cut at Bougere at a cost of $2,693.78. A drainage ditch, requiring 19,969.84 cubic yards of excavation, was cut at Bonnet Carre in the Pontchartrain district at a cost of $2,993.48.

Protection against high water.—Up to May 1 the water in the river above New Orleans had barely reached the bank-full stage: but below New Orleans the water was backed up in the river from the Gulf by a strong east wind and reached a height in some places within a foot of the highest water. The large waves, caused by a strong east wind on April 26, damaged the levee revetment throughout the Barataria and Lake Borgne districts and washed the slopes of the levee, causing four small breaks in the levee at Metcalf (1030 R), Barataria district. These breaks have been closed and preparations are now being made to take the levee machine down to increase the section of the levee where the crevasses occurred.

Construction.—During the past year construction forces were employed almost continuously in one or more of the districts.

No muck or base ditches were cut during the past season, as all old embankments enlarged were known to be free from leaks, and the foundations of all new levees were free from objectionable matter.

The completion of the new Bougere levee on June 28, 1910, by the United States, gives a continuous line of levee in the Lower Tensas levee district as far down as Point Breeze, about 9 miles above Old River.

The Bougere crevasses occurred during one of the early floods, probably in 1859, and remained entirely open until 1902 or 1903, at which time the closing was begun, the closing being effected as follows: In 1901 the levee ended at Ashland, leaving an opening to Old River of about 29 miles. In 1902 to 1904 this gap was closed down as far as Point Breeze, as follows: The United States built from Ashland downstream about 1 mile The local authorities (State of Louisiana) built a levee between 2½ and 3 miles long and joined onto the embankment of the Texas & Pacific Railroad, which served as a levee for a distance of about 4.8 miles to Union Point, and the local authorities (State of Louisiana) built about 12.3 miles of levee from Union Point to Point Breeze, which was completed in 1905.

During the flood of 1903 the Texas & Pacific Railroad embankment and the levee built by the local authorities (State of Louisiana) between the railroad embankment and the levee built by the United States were practically destroyed.

During 1905 to 1907, the United States joined the levee built by the State, where the destruction stopped, to the railroad embankment, building for this purpose about 1¼ miles of levee beyond and below Ashland and north of Union Point, and the railroad rebuilt its embankment, thus closing the crevasse from Ashland as far as Point Breeze.

During the flood of 1907 the railroad embankment partially gave way, but the crevasse was closed by the railroad before the high water of 1908. The levee line from Ashland to Point Breeze, which resisted the flood of 1908, was constructed proportionately as follows: 5,165 linear feet by the United States, about 3,443 linear feet by the local authorities (State of Louisiana), about 8,050 linear feet by the United States, about 25,400 linear feet by the Texas & Pacific Railroad Co, and about 64,700 linear feet by the local authorities (State of Louisiana), the percentage of lengths built by the different parties being as follows: United States, 12.38 per cent; local authorities, 63.83 per cent, and the Texas & Pacific Railroad Co., 23.79 per cent.

In the rear of the Texas & Pacific embankment, which served as a levee, the new levee built by the United States has a length of 30,662 linear feet, and this will now serve in lieu of the railroad embankment, as the railroad company has made an opening in their embankment since the completion of this levee.

Following the custom of previous years, the tabular statements as to levee construction are from the period from May 1, 1910, to April 30, 1911. During this period the total amount of levee completed and paid for by the United States was 1,459,232 cubic yards. The tables of completed and uncompleted levees herewith show the number of cubic yards constructed under each contract, unit prices, and percentage in place.

Tables follow, stating the percentage in length of existing levee system built wholly or in part by the United States, with proportion of the levees now built in each district and the approximate condition of the levee line in the fourth district as to grade.

LOWER TENSAS DISTRICT.

[Completed levees.]

Name of levee.	Miles below Cairo.	Date of completion.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Cost per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Loyd, secs. 1-9..........	626.0 R.	Nov. 13, 1910	10,500	19.7	Enlargement.	110,669.73	17.70	$19,588.54
Buck Ridge, secs. 1-9...	627.5 R.	Nov. 6, 1910	10,500	16.9	...do.....	83,141.06	15.40	12,803.73
Elk Ridge, secs. 1-9.....	629.0 R.	Oct. 29, 1910	10,221	22.0	...do.....	134,143.94	19.05	25,554.42
Evergreen, secs. 1-9.....	632.0 R. 633.0 R. 634.0 R.	Mar. 6, 1911	10,266	17.1	...do.....	109,238.99	19.00	20,755.41
Harpers, secs. 1-3........	654.0 R.	Mar. 30, 1911	4,451	13.1	...do.....	36,469.72	12.90	4,704.60
Melwood, secs. 5-7........	660.0 R.	Apr. 4, 1911	4,300	13.5	...do.....	31,554.22	15.23	4,805.71
Myrtle Grove, secs. 2-9..	661.0 R. 662.0 R.	Apr. 11, 1911	8,700	16.3	...do.....	88,966.40	15.23	13,545.62
Greens:								
Lot 1, secs. 1-6......	723 R.	Aug. 31, 1910	1,400	20.6	New....	80,615.93	31.40	25,313.40
Lot 2, secs. 1 and 3-8.	723 R.	Aug. 20, 1910	1,900	20.2	...do.....	104,744.57	31.50	32,994.54
Lot 3, secs. 1-4 and 7-9.	722 R.	June 29, 1910	1,800	18.9	...do.....	88,061.32	27.98	24,639.56
Bougere:								
Lot 20, sec. 4 [1].......	739.5 R.	June 28, 1910	200	23.4	...do.....	4,210.14	18.00	757.83
Lot 20, sec. 4 [2].......	739.5 R.	.....do........	200	23.4	...do.....	6,911.95	36.98	2,556.04

[1] Cutting out slough in levee.

[2] Filling and refilling slough in levee.

LOWER TENSAS DISTRICT.

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Cost per cubic yard.	Per centage in place.
			Feet.	*Feet.*			*Cents.*	
Kempe, secs. 1-8...	657 R.	Oct. 27, 1910	6,261	19.0	Enlargement.	96,165.49	12.39	(1)
Melwood, secs. 1-4 and 8-10.	660 R.	Aug. 24, 1910	6,173	18.9	.....do........	79,299.15	15.23	15
Myrtle Grove, secs. 1 and 10.	661 R. 662 R.	.....do.......	1,900	18.6	.....do........	22,770.77	15.23	50
Waterproof, secs. 1-10.	663 R. 664 R.	.....do.......	10,700	20.1	.....do........	111,000.00	15.23	6
Grassmere, secs. 1-8.	691 R.	Oct. 27, 1910	8,786	17.1	.....do........	101,345.73	12.39	(1)
Pittsfield, secs. 1-8.	691 R.	.....do........	8,705	17.4	.....do........	104,161.31	12.39	(1)

[1] No work done.

ATCHAFALAYA LEVEE DISTRICT.

[Completed levees.]

Name of levee.	Miles below Cairo.	Date of completion.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Cost per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Allendale, lot 1, secs. 9-10.	824 R.	Apr. 12, 1911	500	20.1	New....	25,275.61	19.20	$4,852.92
Allendale, lot 2, secs. 1-3.	824 R.	Mar. 17, 1911	700	20.5	...do....	37,075.85	19.20	7,118.56

ATCHAFALAYA LEVEE DISTRICT.

[Uncompleted levees.]

Name of levee.	Miles below Cairo.	Date of contract.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Cost per cubic yard.	Percentage in place.
			Feet.	*Feet.*			*Cents.*	
Allendale, lot 1, secs. 1-8.	824 R.	Sept. 2, 1910	2,167	20.7	New....	116,153.37	19.20	10
Allendale, lot 2, secs. 4-10.	824 R.	.....do........	1,753	19.5	...do.....	86,683.87	19.20	6

LAFOURCHE DISTRICT.

[Completed levee.]

Name of levee.	Miles below Cairo.	Date of completion.	Length of levee	Average height above ground surface.	New or enlargement.	Total cubic yards.	Cost per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Lucy, secs. 1-3.......	930 R.	Dec. 30, 1910	1,537	14.3	New....	35,801.16	15⅞	$5,683.47

BARATARIA DISTRICT.

[Completed levee.]

Name of levee.	Miles below Cairo.	Date of completion.	Length of levee.	Average height above ground surface.	New or enlargement.	Total cubic yards.	Cost per cubic yard.	Total cost.
			Feet.	*Feet.*			*Cents.*	
Junior	1009 R.	Dec. 7, 1910	1,780	9.5	New	22,450.00	9.91	$2,224.25

NOTE.—Revetment at Junior levee was completed Mar. 7, 1911, for a length of 1,780 feet at a cost of $1,438.78.

PONTCHARTRAIN DISTRICT.

[Completed levees.]

			Feet.	*Feet.*			*Cents.*	
Gem, secs. 1, 3, 7, 8, 9, 10.	882 L.	June 9, 1910	1,929	18.0	New	76,988.61	16.99	$13,080.37
Bonnet Carre, secs. 1-8.	928 L.	Mar. 20, 1911	12,080	16.0	Enlargement.	90,151.82	17.90	16,137.17
Fairview, secs. 1-9	950 L.	Feb. 23, 1911	3,487 2,785	9.5 16.2	...do New	107,139.19	13.70	14,678.05
Boisblanc, secs. 1-4	954 L.	July 31, 1910	2,173	13.8	...do	54,476.42	14.90	8,117.00

LAKE BORGNE DISTRICT.

[Completed levees.]

			Feet.	*Feet.*			*Cents.*	
Belair	999 L.	Nov. 7, 1910	4,605	12.8	New	102,858.11	9.96	$10,243.23
Burbridge	1002 L.	Dec. 23, 1910	1,777	10.0	...do	28,317.68	16.99	4,811.17

Percentage of length of existing levee system built wholly or in part by the United States.

Name of district.	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
Lower Tensas	71.0	72.0	73.0	73.0	63.0	64.0	64.5	64.7	67.6	66.7	66.1
Atchafalaya	69.0	68.0	67.9	68.0	66.5	66.7	64.7	63.7	63.4	62.8	62.1
Lafourche	82.0	83.0	78.0	77.7	77.6	77.6	77.0	77.0	72.7	72.7	72.4
Barataria	55.0	55.0	55.0	55.0	56.5	55.2	62.6	61.6	57.2	55.5	55.2
Pontchartrain	78.0	78.0	79.0	80.0	86.9	88.2	88.7	88.8	86.1	84.6	84.1
Lake Borgne	46.0	46.0	46.0	44.5	49.7	48.6	54.0	54.3	53.8	55.5	54.9
Whole fourth district, improving Mississippi River.	68.7	69.0	68.6	66.3	66.5	66.8	70.8	69.2	68.2	67.6	67.5

Condition of levees and levee work for period from May 1, 1910, to Apr. 30, 1911.

Levee district.	In system.	Built.	Contents in 1910.	Built since by United States.	Built since by local authorities.	Constructed in 1911.
	Miles.	*Miles.*	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*
Lower Tensas	157.54	150.59	23,966,736	931,517	666,535	1,598,052
Atchafalaya	127.22	127.22	22,173,899	....	379,466	379,466
Lafourche	82.23	82.23	9,657,969	35,801	182,315	218,116
Barataria	71.88	71.88	3,699,565	22,450	31,519	53,969
Pontchartrain	125.78	125.78	18,654,208	382,307	265,747	648,054
Lake Borgne	78.10	78.10	4,251,911	131,175	207,939	339,114
Total	642.75	635.80	82,404,288	1,503,250	1,733,521	3,236,771

Condition of levees and levee work for period from May 1, 1910, to Apr. 30, 1911—Con.

Levee district.	Lost during year.	Contents in 1911.	Required to complete.	Estimated final contents.	Percentage now built.	Including final contents for banquettes.
	Cu. yds.	*Cu. yds.*	*Cu. yds.*	*Cu. yds.*		*Cu. yds.*
Lower Tensas	917,400	[1] 24,647,388	5,629,989	30,277,377	81.7	2,897,800
Atchafalaya	191,350	[2] 22,362,015	3,274,384	25,636,399	87.2	2,720,400
Lafourche	103,642	9,772,443	1,659,551	11,431,994	85.5	1,335,765
Barataria	37,869	3,715,665	1,349,070	5,064,735	78.3	39,992
Pontchartrain	359,712	[3] 18,942,550	2,677,872	21,620,422	87.6	2,201,547
Lake Borgne	174,704	4,416,321	1,421,309	5,837,630	75.6	104,000
Total	1,784,677	83,856,382	16,012,175	99,868,557	83.9	9,299,504

[1] This amount includes 52,819 cubic yards placed on the new Greens levee previous to May 1, 1910, but not included in last year's report on account of levee not being completed and old levee being controlling line.

[2] 62,351 cubic yards placed in the new Allendale levee not included in this amount on account of levee not being completed and old levee being controlling line.

[3] This amount includes 53,551 cubic yards placed in the new Gem levee previous to May 1, 1910, but not included in last year's report on account of levee not being completed and old levee being controlling line.

Condition of levees in fourth district as to grade.

District.	Above highest water.							
	Less than 1 foot.	1 to 2 feet.	2 to 3 feet.	3 to 4 feet.	4 to 5 feet.	Up to grade, but deficient in section.	Up to grade and of required section.	Total length.
	Miles.	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*	*Miles.*
Lower Tensas[1]				34.32	17.80	23.55	74.92	150.59
Atchafalaya				6.03			121.19	127.22
Lafourche[2]		1.07	4.80	4.17		4.47	67.72	82.23
Barataria[3]	7.37	18.26	28.39			2.97	14.89	71.88
Pontchartrain[4]		.04	.13	2.05		19.40	104.16	125.78
Lake Borgne[5]	9.66	18.91	33.51			4.62	11.40	78.10
Total	17.03	38.28	66.83	46.57	17.80	55.01	394.28	635.80

[1] The grade in this district varies from 5 to 6.2 feet above highest water.

[2] The grade in this district varies from 2.9 to 4.2 feet above highest water. The length given from 3 to 4 feet is below grade.

[3] Refers to high water of 1907.

[4] The grade in this district varies from 3.4 to 4.6 feet above highest water. The length given from 3 to 4 feet is below grade.

[5] Refers to high water of 1907.

Levees abandoned by construction of new levees May 1, 1910, to Apr. 30, 1911.

Name.	Miles Below Cairo.	District.	Length.	By whom built.	When built.	By whom last enlarged.	When last enlarged.
			Feet.				
Green	712 R 723 R	Lower Tensas.	16,370	(1)	1866	United States.	1899
			304	State	1903		
			6,201	do	1904		
			3,115	do	1907		
			1,973	do	1909		
			3,035	United States.	1887	United States.	1902
			1,345	State	1904		
Upper Morganza	788 R	Atchafalaya	352	do	1892	United States.	1904
			4,732	do	1882	do	1905
Point Houmas	894 R	Lafourche	1,128	do	1900		
			370	do	1902		
			1,240	do	1879	State	1902
Lucy	930 R	do	1,257	do	1884	United States.	1905

[1] Riparian owners.

Levees abandoned by construction of new levees May 1, 1910, to Apr. 30, 1911—Contd.

Name.	Miles below Cairo.	District.	Length.	By whom built.	When built.	By whom last enlarged.	When last enlarged.
			Feet.				
Schexnaydre	940 R	Lafourche	271	Unknown		United States	1899
			404	State	1904		
Flagville	941 R	do	312	do	1904		
			332	United States	1895	State	1906
Company canal	962 R	do	873	State	1881	do	1895
Junior	1,009 R	Barataria	230	Not known		do	1904
			380	United States	1895	do	1904
			1,096	Not known		United States	1896
			135	State	1909		
Orange Farm	1,029 R	do	1,708	United States	1899		
			115	State	1908		
Pelas to Buras Church	1,038 R	do	120	do	1908		
			320	do	1897		
			941	do	1897		
Point Store	856 L	Pontchartrain	242	United States	1897	United States	1909
			247	State	1879	do	1899
Landry	882 L	do	1,832	do	1882	State	1899
			338	do	1888	United States	1898
Gem	885 L	do	500	United States	1908		
			2,669	do	1891	United States	1902
Gypsy	934 L	do	1,675	State	1905		
			440	do	1899	United States	1896
Fairview	950 L	do	2,402	do	1879	do	1897
			370	United States	1894	State	1898
Bois Blanc	954 L	do	320	State	1904		
			1,751	United States	1897	State	1904
			140	State	1904		
Deckbar	959 L	do	517	do	1879	United States	1892
			361	do	1896		
			187	do	1909		
Scarsdale	989 L	Lake Borgno	1,119	Unknown		United States	1901
			136	United States	1902		
Bertrandville	994 L	do	325	do	1898		
			460	do	1896	United States	1906
Belair	999 L	do	429	State	1906		
			3,126	Unknown		United States	1897
			1,000	do		do	1896
			175	United States	1896		
Burbridge	1,002 L	do	240	Unknown		Unknown	
			2,488	do		United States	1896
Monsecour	1,003 L	do	896	United States	1896	do	1907
E. Duplessis	1,012 L	do	1,700	Unknown		State	1898
A. Cosse	1,017 L	do	1,566	do		do	1895
Fox	1,020 L	do	2,105	do		do	1904
Church	1,020 L	do	822	do		do	1904
Nestor to Burton	1,024 L	do	160	do		do	1901

LOWER TENSAS LEVEE DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $191,823.69, distributed as follows:

Office expenses (main office)	$3,399.48
Other administrative expenses	5,343.97
Construction of levees (contract)	174,171.16
Surveys	1,946.81
Repairs to levees	5,391.80
New plant	9.24
Steamer *Newton*	1,561.23
	191,823.69

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $247.93, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season, and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $376.11.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
"Levees, Tensas front":		
Aug. 2, 1882 (river and harbor)		$426,160.00
Jan. 19, 1884 (river and harbor)		21,000.00
Do	(1)	3,000.00
July 5, 1884 (river and harbor)		90,000.00
Do		8,710.00
Do	(1)	3,400.00
Do	June 16, 1886	1,000.00
Aug. 5, 1886 (river and harbor)	Nov. 20, 1886	11,100.00
Do	July 7, 1887	15,000.00
Do	Aug., 1887	150,000.00
Aug. 11, 1888 (river and harbor)	Oct. 3, 1888	[2] 160,000.00
		889,370.00
"Protection of levees, Tensas front":		
Aug. 5, 1886 (river and harbor)	Mar. 4, 1887	7,000.00
Do	Aug., 1887	6,000.00
Aug. 11, 1888 (river and harbor)	Oct. 3, 1888	10,000.00
		23,000.00
"Levees, Tensas Basin":		
Sept. 19, 1890 (river and harbor)	Dec. 4, 1890	199,500.00
Do	(1)	38,475.00
Do		11,542.50
Do	(1)	1,334.75
Do	(1)	3,000.00
Aug. 5, 1886 (river and harbor)	(3)	21.00
		253,873.25
"Protection of levees, Tensas Basin":		
Sept. 19, 1890 (river and harbor)		9,525.00
Do	(1)	607.50
Do	(1)	70.25
Do	(1)	5,000.00
Do	(1)	5,000.00
		20,202.75
"Protection of levees, fourth district":		
Aug. 11, 1888 (river and harbor)		29,211.94
"Lower Tensas levee district":		
July 13, 1892 (river and harbor)	Aug. 10, 1892	150,000.00
Mar. 3, 1893 (sundry civil)	May 18, 1893	132,000.00
Aug. 18, 1894 (sundry civil)		[4] 67,000.00
Mar. 2, 1895 (sundry civil)		[5] 89,360.00
June 3, 1896 (river and harbor)	June, 1896	45,000.00
June 4, 1897 (sundry civil)	Aug. 20, 1897	228,700.00
July 19, 1897 (deficiency)	July 19, 1897	45,000.00
July 1, 1898 (sundry civil)	Mar. 10, 1898	120,000.00
Do	June 29, 1898	30,000.00
Do	Jan. 17, 1899	3,000.00
Do	Jan. 24, 1899	5,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	217,300.00
June 6, 1900 (sundry civil)	July 20, 1900	110,000.00
June 13, 1902 (river and harbor)	July 12, 1902	110,000.00
Mar. 3, 1903 (sundry civil)	Nov. 25, 1903	110,000.00
Apr. 28, 1904 (sundry civil)	June 25, 1903	110,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	110,000.00
Mar. 3, 1905 (river and harbor)	July 29, 1905	85,000.00
Do	(1)	18,932.86
June 30, 1906 (sundry civil)	June 28, 1906	235,000.00
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907	300,000.00
May 2, 1908 (sundry civil)	May 4, 1908	100,000.00
Received from sales, blue prints		.50
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	100,000.00
Received from sales, blue prints		.25
June 25, 1910 (sundry civil)	Apr. 30, 1910	160,000.00
June 25, 1910 (river and harbor)	July 6, 1910	50,000.00
Received from sales, blue prints		1.25
		2,731,294.86
Grand total		3,946,952.80

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[1] By transfer.

[2] Original allotment $175,000; $5,000 transferred to protection of third district; $10,000 to protection of fourth district.

[3] Reallotted from sales.

[4] Original allotment $132,000; $65,000 transferred to middle Tensas district.

[5] Original allotment $132,000; $40,000 transferred to middle Tensas district and $2,640 to Homochitto district.

ATCHAFALAYA LEVEE DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $21,247.92, distributed as follows:

Office expenses (main office)	$1,247.98
Other administrative expenses	1,162.87
Surveys	7.50
Construction of levees (contract)	18,300.85
New plant	9.24
Steamer *Newton*	519.48
Total	21,247.92

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $247.94, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot, was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $376.11.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
"Atchafalaya front":		
Aug. 2, 1882 (river and harbor)		$110,000.00
Jan. 19, 1884 (river and harbor)		5,000.00
Do		4,000.00
Do		15,000.00
Do		[1] 2,800.00
Aug. 3, 1886 (river and harbor)		40,000.00
		176,800.00
"Levees, right bank below Red River":		
Sept. 19, 1890 (river and harbor)	Dec. 4, 1890	123,975.00
Do	([2])	41,562.50
Do	([2])	12,468.75
Do	([2])	1,441.15
		179,447.40
"Protection of levees, right bank, below Red River," Sept. 19, 1890 (river and harbor)		6,222.30
"Protection of levees, fourth district," Aug. 11, 1888 (river and harbor)		23,663.00
"Atchafalaya levee district":		
July 13, 1892 (river and harbor)	Aug. 10, 1892	155,000.00
Mar. 3, 1893 (sundry civil)	May 18, 1893	152,000.00
Aug. 18, 1894 (sundry civil)		[3] 147,366.95
Mar. 2, 1895 (sundry civil)		[4] 148,960.00
June 3, 1896 (river and harbor)	June , 1896	28,125.00
June 4, 1897 (sundry civil)	Aug. 20, 1897	138,600.00
July 19, 1897 (deficiency)	July 19, 1897	28,125.00
July 1, 1898 (sundry civil)	Mar. 10, 1898	70,000.00
Do	June 29, 1898	17,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	98,800.00
June 6, 1900 (sundry civil)	July 20, 1900	55,000.00
June 13, 1902 (river and harbor)	July 12, 1902	40,000.00
Mar. 3, 1903 (sundry civil)	Nov. 25, 1903	40,000.00
Apr. 28, 1904 (sundry civil)	July 21, 1903	40,000.00
Mar. 3, 1905 (sundry civil)	July 29, 1905	40,000.00
Mar. 3, 1905 (river and harbor)	Apr. 26, 1905	30,000.00
June 30, 1906 (sundry civil)	June 28, 1906	25,000.00
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907	30,000.00
June 25, 1910 (sundry civil)	Apr. 30, 1910	32,000.00
June 25, 1910 (river and harbor)	July 6, 1910	25,000.00
Received from sales blueprints		1.50
		1,340,978.46
Grand total		1,727,111.16

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[1] Original allotment $12,000; $9,200 transferred to Tensas front, New Orleans Harbor, and mouth of Red River.
[2] By transfer.
[3] Original allotment $152,000; $4,633.04 transferred to Pontchartrain levee district.
[4] Original allotment $152,000: $3,040 transferred to Homochitto levee district.

LAFOURCHE LEVEE DISTRICT.

The amount to be expended from June 30, 1910, to June 30, 1911, is $6,887.27, istributed as follows:

ffice expenses (main office)	$248.38
ther administrative expenses	944.65
urveys	7.80
onstruction of levees (contract)	5,683.44
iscellaneous	3.00
Total	6,887.27

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $253.49, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot, was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $376.11.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
"Protection of levees, right bank, below Red River," Sept. 19, 1890 (river and harbor)		$6,222.30
"Protection of levees, fourth district," Aug. 11, 1888 (river and harbor)		32,536.62
"Lafourche levee district:"		
July 13, 1892 (river and harbor)	Aug. 10, 1892	90,000.00
Mar. 3, 1893 (sundry civil)	May 18, 1893	90,000.00
Aug. 18, 1894 (sundry civil)		90,000.00
Mar. 2, 1895 (sundry civil)		[1] 88,200.00
June 3, 1896 (river and harbor)	June , 1896	8,437.50
June 4, 1897 (sundry civil)	Aug. 20, 1897	41,600.00
July 19, 1897 (deficiency)	July 19, 1897	8,437.50
July 1, 1898 (sundry civil)	Mar. 10, 1898	24,000.00
Do	June 29, 1898	12,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	37,050.00
June 6, 1900 (sundry civil)	July 20, 1900	28,000.00
June 13, 1902 (river and harbor)	July 12, 1902	20,000.00
Mar. 3, 1903 (sundry civil)	Nov. 25, 1903	20,000.00
Apr. 28, 1904 (sundry civil)	July 21, 1903	40,000.00
Mar. 3, 1905 (river and harbor)	Apr. 26, 1905	15,000.00
Mar. 3, 1905 (sundry civil)	July 29, 1905	[2] 21,067.14
June 25, 1910 (river and harbor)	July 6, 1910	13,000.00
		646,792.14
Grand total		685,551.06

[1] Original allotment, $90,000; $1,800 transferred to Homochitto levee district.

[2] Original allotment, $40,000; $18,932.86 transferred to Lower Tensas levee district.

BARATARIA LEVEE DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $18,548.71, distributed as follows:

Office expenses (main office)	$657.56
Other administrative expenses	634.23
Construction of levees	5,669.70
Surveys	700.79
Repairs to plant	819.57
New plant	164.92
Care of plant	1.15
Repairs to levees	2.00
Revetment of levees	1,332.57
Salvage levee building machine	8,226.82
Steamer *Newton*	339.40
Total	18,548.71

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $765.79, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot, was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $188.05.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount
"Protection of levees, fourth district," Aug. 11, 1888 (river and harbor)		$2,947.8
"Barataria levee district:"		
July 13, 1892 (river and harbor)	Aug. 10, 1892	60,000.0
Mar. 3, 1893 (sundry civil)	May 18, 1893	60,000.0
Aug. 18, 1894 (sundry civil)		60,000.0
Mar. 2, 1895 (sundry civil)		[1] 58,800.0
June 3, 1896 (river and harbor)	July 19, 1897	3,937.5
June 4, 1897 (sundry civil)	Aug. 20, 1897	19,400.0
July 19, 1897 (deficiency)	July 19, 1897	3,937.5
July 1, 1898 (sundry civil)	Mar. 10, 1898	15,000.0
Do	June 29, 1898	12,000.0
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	24,700.0
June 6, 1900 (sundry civil)	July 20, 1900	14,000.0
June 13, 1902 (river and harbor)	July 12, 1902	10,000.0
Mar. 3, 1903 (sundry civil)	Nov. 25, 1903	10,000.0
Apr. 28, 1904 (sundry civil)	June 25, 1903	15,000.0
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	15,000.0
Mar. 3, 1905 (river and harbor)	July 29, 1905	15,000.0
June 30, 1906 (sundry civil)	June 28, 190[illegible]	10,000.0
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907	25,000.0
May 27, 1908 (sundry civil)	May 4, 1908	40,000.0
June 25, 1910 (sundry civil)	Apr. 30, 1910	25,000.0
Received from sales, blue prints		.3
Total		496,775.3
Grand total		499,723.2

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[1] Original allotment, $60,000; $1,200 transferred to Homochitto levee district.

PONTCHARTRAIN LEVEE DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $43,450.21, distributed as follows:

Office expenses (main office)	$1,624.0
Other administrative expenses	3,222.9
Construction of levees (contract)	38,075.2
Surveys	54.3
Steamer *Newton*	473.8
Total	43,450.2

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $265.85 for use and deterioration of plant being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant for care and repair of plant during the lay-off season and at the engineer depot was $37,611.12, of which the pro rata share chargeable to the above work is estimated to be $376.11.

Abstract of appropriations.

Act of Congress.	Allotted.	Amount.
"Bonnet Carre Crevasse," Aug. 2, 1882 (river and harbor)		$15,000.00
"Levees left bank below Red River:"		
Sept. 19, 1890 (river and harbor)	Dec. 4, 1890	89,775.00
Do		21,850.00
Do		6,750.70
Do		780.90
Total		119,156.60
"Protection of levees, left bank below Red River:"		
Sept. 19, 1890 (river and harbor)		6,563.00
Do	(1)	355.30
Do	(1)	41.10
Do	(1)	3,000.00
Total		9,959.40
"Protection of levees, fourth district," Aug. 11, 1888 (river and harbor)		15,630.57
"Pontchartrain levee district:"		
July 13, 1892 (river and harbor)	Aug. 10, 1892	150,000.00
Mar. 3, 1893 (sundry civil)	May 18, 1893	150,000.00
Aug. 18, 1894 (sundry civil)		150,000.00
Do	(1)	4,633.04
Mar. 2, 1895 (sundry civil)		[2] 147,000.00
June 3, 1896 (river and harbor)	June —, 1896	22,500.00
June 4, 1897 (sundry civil)	Aug. 20, 1897	113,150.00
July 19, 1897 (deficiency)	July 19, 1897	22,500.00
July 1, 1898 (sundry civil)	Mar. 10, 1898	60,000.00
Do	June 29, 1899	16,000.00
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899	74,100.00
June 6, 1900 (sundry civil)	July 20, 1900	50,000.00
June 13, 1902 (river and harbor)	July 12, 1902	101,500.00
Mar. 3, 1903 (sundry civil)	Nov. 25, 1903	81,500.00
Apr. 28, 1904 (sundry civil)	June 25, 1903	90,000.00
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905	90,000.00
Mar. 3, 1905 (river and harbor)	July 29, 1905	60,000.00
June 30, 1906 (sundry civil)	June 28, 1906	35,000.00
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907	120,000.00
May 27, 1908 (sundry civil)	May 4, 1908	75,000.00
Received from sales, blue prints		.25
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909	40,000.00
June 25, 1910 (sundry civil)	Apr. 30, 1910	27,000.00
June 25, 1910 (river and harbor)	July 6, 1910	23,000.00
Total		1,702,883.29
Grand total		1,862,629.86

(1) By transfer.

[2] Original allotment, $150,000; $3,000 transferred to Atchafalaya levee district.

LAKE BORGNE LEVEE DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $23,451.88, distributed as follows:

Office expenses (main office)	$653.70
Other administrative expenses	925.77
Construction of levees	12,920.03
Surveys	735.04
Repairs to plant	489.55
New plant	3,895.82
Revetment of levee	12.00
Salvage of levee building machine	3,479.97
Steamer *Newton*	340.00
Total	23,451.88

In compliance with resolution of the commission adopted April 9, 1906, there should be added to the above total cost for the year $389.90, for use and deterioration of plant, being a charge of 3 per cent per annum for use of plant and 4 per cent per annum for deterioration. During the year the total amount charged to the allotment for plant, for care and repair of plant during the lay-off season and at the engineer depot was $37,611.12, of which the pro-rata share chargeable to the above work is estimated to be $188.06.

Abstract of appropriations.

Act of Congress.	Allotted.
July 13, 1892 (river and harbor)	Aug. 10, 1892
Mar. 3, 1893 (sundry civil)	May 18, 1893
Aug. 18, 1894 (sundry civil)	
Mar. 2, 1895 (sundry civil)	
June 3, 1896 (river and harbor)	June —, 1896
June 4, 1897 (sundry civil)	Aug. 20. 1897
July 19, 1897 (deficiency)	July 19, 1897
July 1, 1898 (sundry civil)	Mar. 10, 1898
Do	June 29, 1898
Mar. 3, 1899 (sundry civil)	Mar. 13, 1899
June 6, 1900 (sundry civil)	July 20, 1900
June 13, 1902 (sundry civil)	July 12, 1902
Do	Mar. 4, 1903
Mar. 3, 1903 (sundry civil)	Nov. 25, 1903
Apr. 28, 1904 (sundry civil)	June 25, 1903
Mar. 3, 1905 (sundry civil)	Apr. 26, 1905
Mar. 3, 1905 (river and harbor)	July 29, 1905
June 30, 1906 (sundry civil)	June 28, 1906
Mar. 2, 1907 (river and harbor)	Mar. 27, 1907
May 27, 1908 (sundry civil)	May 4, 1908
Mar. 4, 1909 (sundry civil)	Apr. 28, 1909
June 25, 1910 (sundry civil)	Apr. 30, 1910
June 25, 1910 (river and harbor)	July 6, 1910

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[1] Original allotment $50,000; $1,000 transferred to Homochitto levee district.

HOMOCHITTO LEVEE DISTRICT.

The amount expended from June 30, 1910, to June 30, 1911, is $2,501.22, dis as follows:

Office expenses (main office)		
Other administrative expenses		
Field work and drafting:		
Materials	$42.86	
Wages	1,329.58	
Subsistence	554.10	
		1,
Repairs to plant		
Care of plant		
New plant		
Total		

In compliance with resolution of the commission adopted April 9, 190 should be added to the above total cost for the year $247.93, for use and dete of plant, being a charge of 3 per cent per annum for use of plant and 4 per annum for deterioration. During the year the total amount charged to the a for plant, for care and repair of plant during the lay-off season and at the depot was $37,611.12, of which the pro rata share chargeable to the above estimated to be $376.11.

Abstract of appropriations.

Act of Congress.	Allotted.
June 25, 1910 (river and harbor)	July 6, 1910
Received from sales, blue prints	
Total	

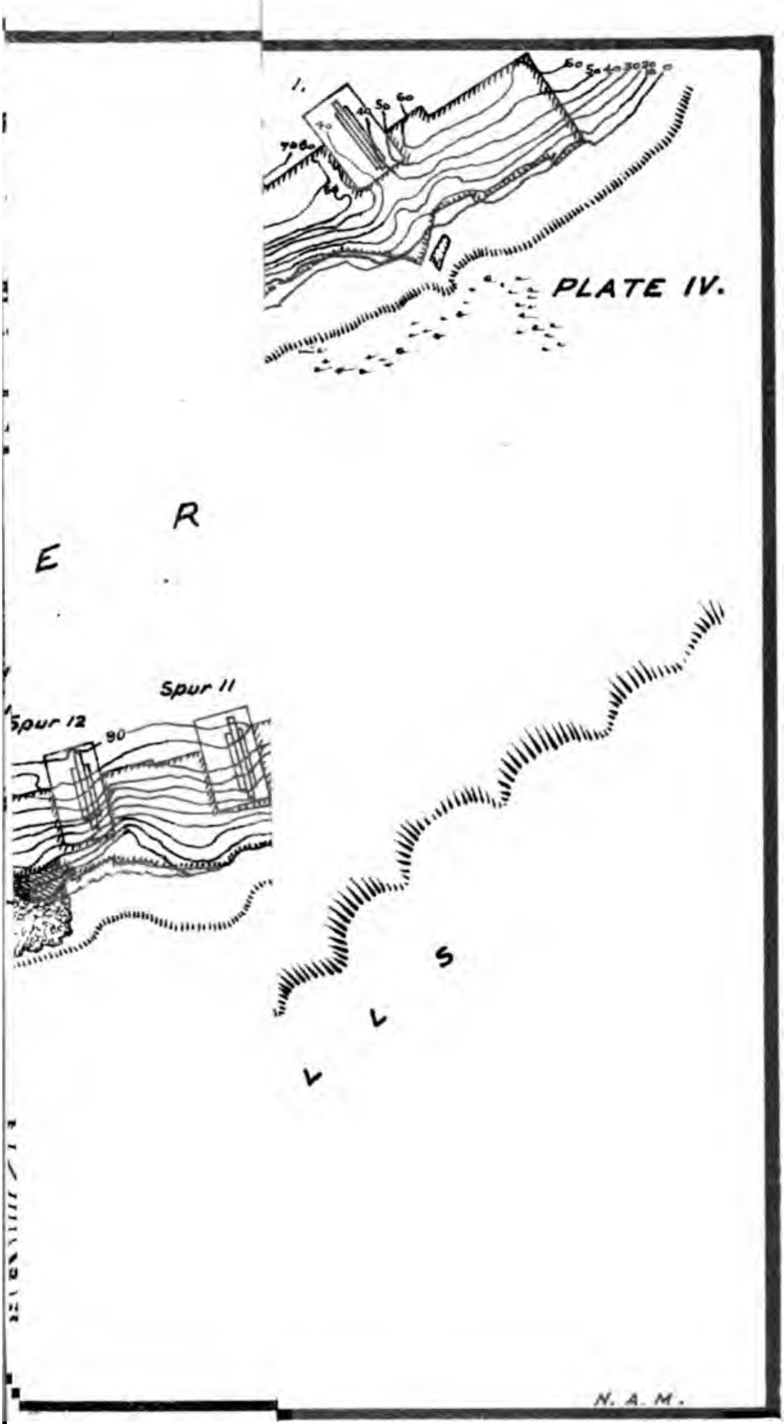

PLATE IV.

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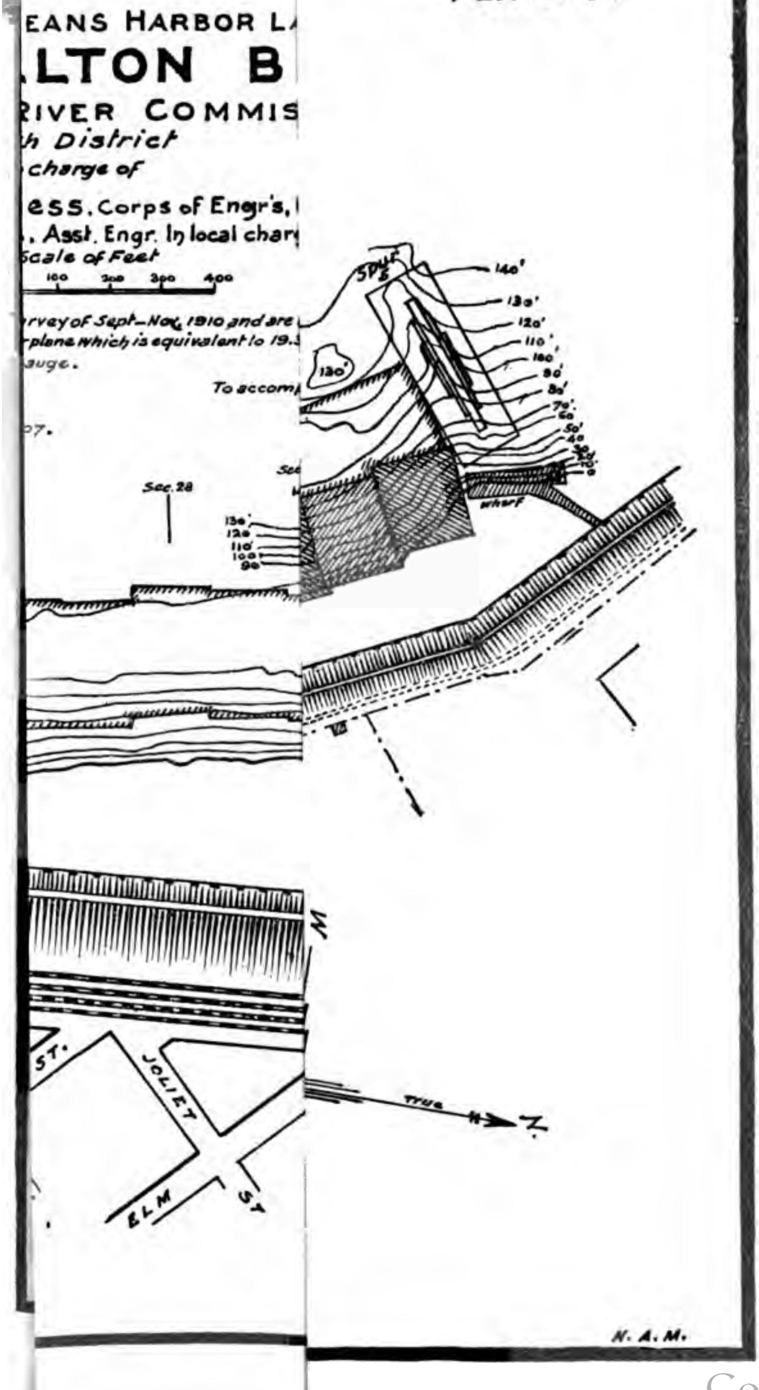
House Doc. 129; 62d Cong. 2d Sess.

PLATE V.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COMMERCIAL STATISTICS.

By direction of the commission the duty of compiling the commercial statistics of the Mississippi River is assigned to the secretary of the commission. Reference to his report is invited for the statistics of that part of the river included in the fourth district.

The following papers accompany and form part of this report:

Appendix A.—Abstract of all contracts in force during the fiscal year ending June 30, 1911.

Plate I.—Reid-Bedford Bend.[1]
Plate II.—Kempe Bend (upper).[1]
Plate III.—Kempe Bend (lower).[1]
Plate IV.—Giles Bend, Natchez and Vidalia Harbors.
Plate V.—Carrollton Bend, New Orleans Harbor.
Plate VI.—Gretna Bend, New Orleans Harbor.[1]
Plate VII.—Third district reach, New Orleans Harbor.[1]
Plate VIII.—Lower Tensas levee district.[1]
Plate IX.—Atchafalaya, Lafourche, and Pontchartrain levee districts.[1]
Plate X.—Lake Borgne and Barataria levee districts.[1]

Respectfully submitted.

H. BURGESS,
Major, Corps of Engineers, United States Army.

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[1] Not printed.

APPENDIX A.—*Abstract of contracts in force during fiscal year ending June 30, 1911.*

FOURTH DISTRICT, IMPROVING MISSISSIPPI RIVER.

Name of contractor.	Amount and character of work.	Unit price.	Date of approval.	Date of beginning of work.	Date of expiration of contract.
Robt. T. Clark	119,000 cubic yards levee work	27.98 cents	Oct. 1, 1909	Mar. 26, 1910	July 31, 1910.[1]
	20,000 cubic yards levee work	19.95 cents			
M. L. Linnan	437,000 cubic yards levee work	36.98 cents	July 5, 1907	June 24, 1907	Mar. 18, 1909.[2]
O. A. Gibson	130,000 cubic yards levee work	16.99 cents	Nov. 22, 1909	Feb. 14, 1910	Dec. 31, 1910.[1]
Ed. J. Howard	Towboat Plaquemine	$38,700	July 6, 1909	Aug. 2, 1909	Apr. 28, 1910.[1]
Robt. T. Clark	50,000 cubic yards levee work	14.9 cents	Jan. 14, 1910	Apr. 15, 1910	Aug. 5, 1910.[1]
Helgason Bros	118,500 cubic yards levee work	31.5 cents	July 31, 1909	Mar. 6, 1910	Jan. 11, 1911.[1]
Donovan & Daley	103,000 cubic yards levee work	31.4 cents	Aug. 20, 1909	Feb. 13, 1910	Nov. 23, 1910.[1]
Israel R. Bobbitt	110,000 cubic yards levee work	17.7 cents	Aug. 3, 1910	July 11, 1910	Jan. 2, 1911.[1]
Donovan & Daley	78,000 cubic yards levee work	15.4 cents	July 28, 1910	July 19, 1910	Apr. 7, 1911.[1]
Robt. T. Clark	131,000 cubic yards levee work	19.05 cents	Aug. 9, 1910	July 21, 1910	May 16, 1911.[1]
A. S. Dyar	Rent of office	$137.50 per month	Lease	Oct. 1, 1909	Sept. 30, 1910.[1]
Pat H. Lyons	26,000 cubic yards levee work	16.99 cents	Sept. 8, 1910	Aug. 16, 1910	Jan. 1, 1911.[1]
Israel R. Bobbitt	36,000 cubic yards levee work	15½ cents	Nov. 22, 1910	Dec. 16, 1910	Feb. 9, 1910.[1]
John Riess	10,000 tons rock	$2.25 per ton	Aug. 19, 1910	Aug. 15, 1910	Nov. 1, 1910.[1]
O. A. Gibson	106,000 cubic yards levee work	19 cents	Nov. 12, 1910	Nov. 7, 1910	Jan. 1, 1911.[3]
Richard M. Murphy	50,000 tons rock	$1.93 per ton	July 16, 1910	Aug. 5, 1910	Jan. 1, 1911.[4]
Robt. T. Clark	94,000 cubic yards levee work	17.9 cents	Oct. 17, 1910	Sept. 13, 1910	Apr. 3, 1911.[1]
	107,000 cubic yards levee work	13.7 cents			
A. J. Terrell	13,000 tons rock	$1.90 per ton	Nov. 30, 1910	Nov. 15, 1910	Mar. 1, 1911.[1]
Ed. J. Howard	Steamer Teche	$16,850	July 20, 1910	Aug. 8, 1910	Dec. 9, 1910.[1]
E. H. Jackson	36,500 cubic yards levee work	12.9 cents	Nov. 7, 1910	Jan. 26, 1911	Mar. 1, 1911.[2]
Johnson Iron Works	Steamer Lafourche	$39,000	Aug. 13, 1910	Jan. 11, 1911	Apr. 7, 1911.
Hearin & Ryan	302,500 cubic yards levee work	12.39 cents	Nov. 22, 1910	Dec. 9, 1910	Mar. 13, 1912.
Do	334,000 cubic yards levee work	15.23 cents	Aug. 31, 1910	Dec. 31, 1910	Feb. 16, 1912.
A. S. Dyar	Rent of office	$137.50 per month	Lease	Oct. 1, 1910	Sept. 30, 1911.[5]
Hercules Co. (Ltd.)	257,000 cubic yards levee work	19.2 cents	Sept. 22, 1910	Dec. 27, 1910	Mar. 10, 1911.[6]
Des Moines Bridge & Iron Co.	2 steel barges	$15,900	Apr. 5, 1911	Apr. 21, 1911	Oct. 18, 1911.
Metropolitan Bank	Rent of office	$165 per month	Lease	June 15, 1910	Sept. 30, 1912.
Guy Dickinson	60,000 tons rock	$2 per ton			

[1] Contract completed during the year.
[2] Time limit waived; contract completed during year.
[3] Date of completion changed by supplemental agreement of Dec. 31, 1910, approved Jan. 14, 1911; contract completed during year.
[4] Contract terminated by supplemental agreement of Mar. 10, 1911, approved Mar. 20, 1911; contract completed during year.
[5] Terminated June 15, 1911, by supplemental agreement of Apr. 22, 1911, approved Apr. 27, 1911.
Time limit waived.

REID-BEDFORD BEND, LA.

Amount allotted from sundry civil act approved June 25, 1910		$40,000.00
Amount allotted from river and harbor act approved June 25, 1910		50,000.00
		90,000.00
June 30, 1911, amount expended during fiscal year:		
For works of improvement	$75,960.55	
For maintenance of improvement	9,870.28	
		85,830.83
		4,169.17
July 1, 1911, outstanding liabilities		1,390.54
July 1, 1911, balance available		2,778.63
Amount (estimated) required for completion of existing project		[1] Indeterminate.

HARD TIMES BEND.

Amount allotted from river and harbor act approved June 25, 1910	$5,000.00
June 30, 1911, amounted expended during fiscal year, for works of improvement	1,802.76
July 1, 1911, balance available	3,197.24
Amount (estimated) required for completion of existing project	[1] Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
For works of improvement—	
Maximum	300,000.00
Minimum	[1] 200,000.00

BONDURANT.

July 1, 1910, balance unexpended	$1,000.00
June 30, 1911, amount expended during fiscal year, for maintenance of improvement	86.35
July 1, 1911, balance unexpended	913.65
July 1, 1911, balance available	913.65
Amount (estimated) required for completion of existing project	[1] Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1913:	
For works of improvement	4,000.00
For maintenance of improvement	1,000.00
Total	[1] 5,000.00

KEMPE BEND REVETMENT.

July 1, 1910, balance unexpended		$91,296.99
Amount allotted from river and harbor act approved Feb. 27, 1911		275,000.00
		366,296.99
June 30, 1911, amount expended during fiscal year:		
For works of improvement	$86,901.91	
For maintenance of improvement	15,887.40	
		102,789.31
July 1, 1911, balance unexpended		263,507.68
July 1, 1911, outstanding liabilities		97,338.71
July 1, 1911, balance available		166,168.97
July 1, 1911, amount covered by uncompleted contracts		87,619.20
Amount (estimated) required for completion of existing project		[1] Indeterminate.

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[1] Exclusive of the balance unexpended July 1, 1911.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	Maximum.	Minimum.
For works of improvement	$150,000.00	$100,000.00
For maintenance of improvement	50,000.00	50,000.00
Total	[1] 200,000.00	[1] 150,000.00

NATCHEZ AND VIDALIA HARBORS.

July 1, 1910, balance unexpended		$174,000.00
Amount allotted from river and harbor act approved Feb. 27, 1911		75,000.00
		249,000.00
June 30, 1911, amount expended during fiscal year:		
For works of improvement	$156,964.43	
For maintenance of improvement	13,623.79	
		170,588.22
July 1, 1911, balance unexpended		78,411.78
July 1, 1911, outstanding liabilities		40,602.26
July 1, 1911, balance available		37,809.52
July 1, 1911, amount covered by uncompleted contracts		23,425.80
Amount (estimated) required for completion of existing project		[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	
For maintenance of improvement—	
Maximum	[1] 50,000.00
Minimum	[1] 25,000.00

ATCHAFALAYA AND RED RIVERS, LA.

July 1, 1910, balance unexpended	$35,058.32
June 30, 1911, amount expended during fiscal year for maintenance of improvement	10,594.69
July 1, 1911, balance unexpended	24,463.63
July 1, 1911, outstanding liabilities	3,054.49
July 1, 1911, balance available	21,409.14
Amount (estimated) required for completion of existing project	[1] Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement	[1] 25,000.00

HARBOR AT NEW ORLEANS, LA.

July 1, 1910, balance unexpended		$175,000.00
Amount allotted from river and harbor act approved Feb. 27, 1911		200,000.00
		375,000.00
June 30, 1911, amount expended during fiscal year:		
For works of improvement	$135,023.24	
For maintenance of improvement	12,465.68	
		147,488.92
July 1, 1911, balance unexpended		227,511.08
July 1, 1911, outstanding liabilities		12,982.82
July 1, 1911, balance available		214,528.26
Amount (estimated) required for completion of existing project		[1] Indeterminate.

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[1] Exclusive of the balance unexpended July 1, 1911.

Amount that can be profitably expended in fiscal year ending June 30, 1913:

	Maximum.	Minimum.
For works of improvement	$150,000.00	$50,000.00
For maintenance of improvement	25,000.00	25,000.00
Total	[1]175,000.00	[1]75,000.00

PLANT, FOURTH DISTRICT.

uly 1, 1910, balance unexpended		$233,116.59
mount allotted from river and harbor act approved Feb. 27, 1911		100,000.00
ale of condemned property		1,753.55
ransfer from first and second districts		25,956.41
		360,826.55
une 30, 1910, amount expended during fiscal year:		
For works of improvement	$170,258.53	
For maintenance of improvement	37,611.12	
		207,869.65
uly 1, 1911, balance unexpended		152,956.90
uly 1, 1911, outstanding liabilities		32,579.08
uly 1, 1911, balance available		120,377.82
uly 1, 1911, amount covered by uncompleted contracts		27,600.00
mount (estimated) required for completion of existing project		[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:

	Maximum.	Minimum.
For works of improvement	$65,000.00	....
For maintenance of improvement	35,000.00	$35,000.00
Total	[1]100,000.00	[1]35,000.00

SURVEYS, FOURTH DISTRICT.

uly 1, 1910, balance unexpended	$5,002.50
mount allotted from river and harbor act approved Feb. 27, 1911	5,000.00
ale of blue prints	2.50
	10,002.50
une 30, 1911, amount expended during fiscal year, for maintenance of improvement	4,889.03
uly 1, 1911, balance unexpended	5,113.47
uly 1, 1911, outstanding liabilities	302.80
uly 1, 1911, balance available	4,810.67
mount (estimated) required for completion of existing project	[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:

For works of improvement—	
Maximum	5,000.00
Minimum	[1]5,000.00

LOWER TENSAS LEVEE IDSTRICT.

uly 1, 1910, balance unexpended	$277,857.90
ale of blue prints	1.25
	277,859.15

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[1] Exclusive of the balance unexpended July 1, 1911.

June 30, 1911, expended during fiscal year:		
For works of improvement	$186,431.89	
For maintenance of improvement	5,391.80	
		$191,823.69
July 1, 1911, balance unexpended		86,035.46
July 1, 1911, outstanding liabilities		59,229.61
July 1, 1911, balance available		26,805.85
July 1, 1911, amount covered by uncompleted contracts		58,940.99
Amount (estimated) required for completion of existing project		[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	Maximum.	Minimum.
For works of improvement	$140,000.00	$50,000.00
For maintenance of improvement	10,000.00	10,000.00
Total	[1]150,000.00	[1]60,000.00

ATCHAFALAYA LEVEE DISTRICT.

July 1, 1910, balance unexpended	$57,000.00
Sale of blue prints	1.50
	57,001.50
June 30, 1911, amount expended during fiscal year: For works of improvement	21,247.92
July 1, 1911, balance unexpended	35,753.58
July 1, 1911, outstanding liabilities	31,144.83
July 1, 1911, balance available	4,608.75
July 1, 1911, amount covered by uncompleted contracts	31,043.15
Amount (estimated) required for completion of existing project	[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	
For works of improvement	70,000.00
For maintenance of improvement	5,000.00
Total	[1] 75,000.00

LAFOURCHE LEVEE DISTRICT.

July 1, 1910, balance unexpended	$13,000.00
June 30, 1911, amount expended during fiscal year for works of improvement	6,887.27
July 1, 1911, balance unexpended	6,112.73
July 1, 1911, balance available	6,112.73
Amount (estimated) required for completion of existing project	[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	
For works of improvement	20,000.00
For maintenance of improvement	5,000.00
Total	[1]25,000.00

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[1] Exclusive of the balance unexpended July 1, 1911.

BARATARIA LEVEE DISTRICT.

July 1, 1910, balance unexpended		$25,000.00
Sale of blue prints		.50
		25,000.50
June 30, 1911, amount expended during fiscal year:		
For works of improvement	$10,321.89	
For maintenance of improvement	8,226.82	
		18,548.71
July 1, 1911, balance unexpended		6,451.79
July 1, 1911, outstanding liabilities		1,036.31
July 1, 1911, balance available		5,415.48
Amount (estimated) required for completion of existing project		[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	Maximum.	Minimum.
For works of improvement	$20,000.00	$12,500.00
For maintenance of improvement	5,000.00	2,500.00
Total	[1] 25,000.00	[1] 15,000.00

PONTCHARTRAIN LEVEE DISTRICT.

July 1, 1910, balance unexpended	$66,573.38
June 30, 1911, amount expended during fiscal year for works of improvement	43,450.21
July 1, 1911, balance unexpended	23,123.17
July 1, 1911, outstanding liabilities	335.54
July 1, 1911, balance available	22,787.63
Amount (estimated) required for completion of existing project	[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	
For works of improvement	$30,000.00
For maintenance of improvement	5,000.00
Total	[1] 35,000.00

LAKE BORGNE LEVEE DISTRICT.

July 1, 1910, balance unexpended		$26,528.80
June 30, 1911, amount expended during fiscal year:		
For works of improvement	$19,971.91	
For maintenance of improvement	3,479.97	
		23,451.88
July 1, 1911, balance unexpended		3,076.92
July 1, 1911, outstanding liabilities		121.50
July 1, 1911, balance available		2,955.42
Amount (estimated) required for completion of existing project		[1] Indeterminate.

Amount that can be profitably expended in fiscal year ending June 30, 1913:	Maximum.	Minimum.
For works of improvement	$20,000.00	$12,500.00
For maintenance of improvement	5,000.00	2,500.00
Total	[1] 25,000.00	[1] 15,000.00

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[1] Exclusive of the balance unexpended July 1, 1911.

HOMOCHITTO LEVEE DISTRICT.

Amount allotted from river and harbor act approved June 25, 1910	$3,000.00
Sale of blue prints	1.10
	3,001.10
June 30, 1911, amount expended during fiscal year for works of improvement	2,501.22
July 1, 1911, balance unexpended	499.88
Amount (estimated) required for completion of existing project	[1] Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement	[1] 75,000.00

PLAQUEMINE, LA., REVETMENT.

Amount allotted from river and harbor act approved Feb. 27, 1911	$50,000.00
June 30, 1911, amount expended during fiscal year for works of improvement	23.62
July 1, 1911, balance unexpended	49,976.38
July 1, 1911, outstanding liabilities	2,768.18
July 1, 1911, balance available	47,208.20
Amount (estimated) required for completion of existing project	[1] Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1913, for works of improvement:	
Maximum	[1] 125,000.00
Minimum	[1] 50,000.00

GENERAL REPAIRS AND STONE.

Amount allotted from river and harbor act approved Feb. 27, 1911	$25,000.00
July 1, 1911, balance unexpended	25,000.00
July 1, 1911, balance available	25,000.00
Amount (estimated) required for completion of existing project	[1] Indeterminate.
Amount that can be profitably expended in fiscal year ending June 30, 1913, for maintenance of improvement:	
Maximum	[1] 35,000.00
Minimum	[1] 20,000.00

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